



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

HIGH SCHOOL EDUCATION

HIGH SCHOOL EDUCATION

HIGH SCHOOL EDUCATION

**PROFESSIONAL TREATMENTS OF THE ADMINISTRATIVE, SUPERVISORY,
AND SPECIFICALLY PEDAGOGICAL FUNCTIONS OF SECOND-
ARY EDUCATION, WITH SPECIAL REFERENCE
TO AMERICAN CONDITIONS**

**EDITED BY
CHARLES HUGHES JOHNSTON, PH.D. (HARVARD)
DEAN OF THE SCHOOL OF EDUCATION OF THE
UNIVERSITY OF KANSAS**

**NEW YORK
CHARLES SCRIBNER'S SONS
1912**

70 1110
10908120

131001
511

COPYRIGHT, 1912, BY
CHARLES SCRIBNER'S SONS

EDUCATION DEPT.



INTRODUCTION

THE American high school is our most interesting educational institution, more democratic than the college and more selective than the elementary school. Manhood and womanhood are visibly budding. This fullness of life bewilders both the teachers and the students. Extravagant administrative and pedagogical wastes and misdirections cannot, however, prevent this fertile soil from producing educational fruitage. The high school as an institution enjoys, despite itself, a fair measure of success. With a sort of blind acceptance of mediæval formulæ it has stubbornly administered the same dose to all its students for a long time. Latin, Greek, and mathematics formerly killed or cured all. More recently the "mathematics and any foreign language" requirement, "the trunk of the curriculum," has constituted a modern "unescapable minimum." More have braved this treatment, and fewer have been killed. The scientific basis for this common treatment for all has of late been called into question. Is a foreign language, or is mathematics, or is any single subject, in itself necessary for all types of persons and all varieties of purposes? The school's process of elimination has been a rule-of-thumb ministration. It should be based upon intelligent diagnosis and should represent more varied forms of treatment.

There is no such thing as a high school pedagogy. It is time all students of secondary education should recognize that we must rather speak of high school pedagogies.

There is already a fair pedagogy of language, something of a distinctive mathematical method, and, since Spencer, some think, a science procedure. Yet new subjects and even new functions for old subjects call for new pedagogies. Doubtless under modern high school conditions all our pedagogies must be remodelled. This is particularly evident in the cases of history, physics, English, biology, high school music, and all the so-called incoming subjects. Industrial education or agricultural education, for example, of a genuinely vocational character will bring into existence a pedagogy of school practice totally different from traditional text-bookish routine. So may modern physics and industrial chemistry, and so even may English. We have not discovered, again, the school avenue of approach to civic, or moral, or social enlightenment, nor are we likely to do so with traditional pedagogy.

This book attempts to do some pioneering in this promising experimental field. The first five chapters seek to suggest a characteristic setting for a broader and more variable institutional functioning, leaving a wide-open development possible. The following chapters represent conscious attempts to differentiate the distinguishable elements and pedagogical features one encounters in adapting to boys and girls of high school age the educational possibilities inherent in our twentieth century programme of studies. All the authors have assumed this *multiplicity of pedagogies*. The editor does not, in every case, agree with the convictions expressed, nor with the points chosen for greatest emphasis, nor can he intelligently disagree in many cases. It is hoped that the reader may find himself in the same dilemma frequently. Our urgent problem has been to

present squarely and to define as concisely as possible genuine issues, and *to collate educational theories of values viewed from intimacy of acquaintance with the further boundaries of the subject-matter as well as with desirable working high school conditions.*

We tend to put our educational theory into text-books on educational psychology, principles of education, philosophy of education, general pedagogy, or theory and practice of teaching, and casually to refer to the differentiated disciplines within courses of study themselves. This book changes the emphasis and adopts something of the English custom or the German custom of reading whatever of scientific or established pedagogy we have definitely and specifically into the instruction matter we must in any case dispense. These treatments may in a sense be viewed as attempts at distinctions and co-ordinations of specific disciplines, rather than as moulds fashioned beforehand for a formal general discipline, a predetermined type of educational psychology, or as deductions from some favorite but remotely related philosophical system.

High school didactics offers then a promising field for investigation. Every prospective and actual teacher and every school administrator should have a conception of certain distinguishing functions of whatever subject-matter our high school programmes of study embrace, without as well as within the range of a particular branch of study. This book represents a co-operative attempt to put on record in a single usable volume an authoritative consensus of scholarly conviction as to what high school instruction may accomplish. The American high school is a socializing agency of our democracy also, and has still other aims in addition to the instructional one, which

must be treated in a subsequent volume. But it will always be a distinguishing function of an educational institution of secondary grade to realize itself chiefly through the spirit and matter of what it transmits systematically. The greatest obstacle to effective high school teaching is that the teachers teach mathematics with no clear notion why, and Latin or history or science, assuming likewise that in some mysterious way a result— not specified—will come about of itself.

This book attempts to treat from every angle possible the best approaches, theoretical and practical, to the genuine problems of high school programmes of study and curriculums, and of all the special courses of study which a high school may hope to administer and teach.

The contributors of the first five and the last chapters have had a free field within the limitations of their subject. Beginning with Chapter VI the writers have all consciously followed a common scheme of treatment. The following topics where feasible have been in some way incorporated in the separate discussions, and should be kept in mind by the critical reader as a sort of key to the plan of the book, as well as to the meaning of the chapters.

1. A simple statement of the broader aspects of this distinctive field of education, indicating the philosophical and logical background in such a way as to broaden the reader's comprehension of the deeper educational significance of the subject.

2. A specific adjustment of the moral, æsthetic, social, and practical disciplines to be reasonably expected from a study of this subject.

3. A brief sketch of the actual history of the subject in the school curriculum.

4. The gradual change and improvement in the text-book presentations of the subject.
5. The gradual improvements in other apparatus than text-books, adopted for use in teaching it.
6. The gradual change in the conception of its educational value.
7. The degree and nature of correlation with other subjects, particularly since the report of the Committee of Ten of the National Education Association.
8. The growing refinement of methods for presenting the subject.
9. The grade preparation to be presupposed at present.
10. Its present status and the grounds for it as seen from a comparison of typical high school curriculums. The future possible developments and the grounds for this (growing, steady, or losing position?).
11. The social, psychological, and practical obstacles to its attaining its ideal educational aim.
12. The necessary, and also the more ideal preparation, academic and professional, called for in the teacher.
13. Appended bibliography, (a) additional references to books and special monographs dealing with the topics incorporated in the discussion, (b) a suggested list of books desirable for reference for high school libraries.

The contributors are men invited to co-operate in this undertaking because of their combined interest in the high school point of view and in the development of the subject-matter of their discussions. All writers have constantly kept in mind the original purpose of the book, *that the life purposes of high school students constitute the ultimate objects of reference*—not college admission

standards, if these seem seriously to conflict with the broader aim. The work is intended primarily to appeal to all serious students of our modern high school, including State, county, and city superintendents, high school principals of all grades, and high school teachers in service. It may serve as a text in secondary education for prospective teachers in schools of education, departments of education, and normal schools.

The comprehensive plan of the undertaking makes of the volume something totally different from the common one-man solution of all these problems. No author could have written any other than his own chapter, yet all authors accepted the conditions of uniformity in treatment, so that there is that measure of unity which expert knowledge and serious co-operation will allow. No reader should expect final solutions of these problems. Such a unity for our book's conclusions would have been spurious. Instead the reader may here find honest and well-known scholars struggling to make plain and simple the reasons why we do or should not do these simple teaching operations which, without such articulate conviction, will deaden the greater part of our professional service.

The editor has found easily a place for instruction of classes in education in the subject-matter of this volume. The plan has evolved from class-room experience. Education departments, teachers' colleges, and many normal schools offer courses in "secondary education," "the American high school," "high school problems," "history and principles of secondary education," or "the high school course of study." In such courses as these the doctrine described above of *specialized pedagogies* applies. The contents of this type of course well illus-

trate the truth that college courses also call for a variety of pedagogies. From the editor's experience with students of this subject at Dartmouth College, and for three years and three summer terms at the University of Michigan with a large proportion of practical experienced school administrators in the classes, and from a similar experience at the University of Kansas, the following method of treatment is suggested where the volume is adopted as a text. Limit the class to twenty or twenty-five members. Conduct somewhat as a seminary. Spend the first third of the term in class discussions of the problems of the first five chapters. Insist upon a good bit of reference work, as references are abundant and easily accessible. Emphasize the applicability and desirability of adoption of the principles advocated to the particular State or States represented by the members of the class. Then assign, by student's choice where possible, the topics of the succeeding chapters. Have the students in the preparation of their individual reports follow pretty closely, but in no particular order, the topics suggested in this introduction. Allow each student one-half the hour of a class meeting to make his report, and then conduct the class discussion in an attempt to compare the book treatment with the independent student's report upon the topic. Many students will have had some experience; many will have had a teachers' course in some subject, and all will have some preferred subject which they expect to teach. There is small likelihood that root questions, new developments, and a wide outlook on their professional participation in educational service will be overlooked. Throughout one ideal of the course should be to have prospective high school teachers realize the necessity that they understand

those high school courses of study which differ radically in function from their own.

In the near future also we may expect that these questions will occupy some of the time of our *high school faculty meetings*. High school principals will eventually actually administer and supervise in clear and mutual co-operation with their faculties these near problems of the actual instruction itself of the school. Some modification of the plan for class use suggested above will be found adaptable to these meetings when they become *real meetings of educators*.

There has been a concerted and thorough-going attempt by the authors to make the bibliography feature of the book up-to-date, reliable, and useful. High school principals, those directing the purchase of books for high school libraries, those directing reading circles, and particularly those who desire to pursue the questions raised by the different topics as treated, are urged to consult the references chapter by chapter. To insure the usefulness of these select and authorized lists of books and monographs, prices and publishers are in most cases given.

The book is dedicated to the high school teachers and principals of the country in whose awakening and encouragement it hopes to play some part.

CHARLES HUGHES JOHNSTON, *Editor*.

UNIVERSITY OF KANSAS.

CONTENTS

	PAGE
INTRODUCTION	V
 CHAPTER I—CURRENT DEMANDS UPON THE PRO- GRAMME OF STUDIES	 3
BY CHARLES HUGHES JOHNSTON, PH.D. (Harvard), <i>Dean of the School of Education, University of Kansas.</i>	
1. A modern problem. 2. Co-operative relationship of school and college. 3. Multiplying kinds of education and their so- cial significance. 4. The public interest in courses of study. 5. Leading issues that are eventuating. 6. Typical modern crit- icism. 7. Wholesale curriculum experimentation. 8. Tech- nical curriculum problems. 9. A basis for reconstruction. 10. The future of the American high school.	
 CHAPTER II—THE DISCIPLINARY BASIS OF COURSES OF STUDY	 31
BY CHARLES HUGHES JOHNSTON.	
1. Disciplinary contrasted with utilitarian basis. 2. A broader conception of educational discipline. 3. Conflicting conceptions. 4. Sidis and James <i>vs.</i> Babbitt. 5. The theory of formal discipline. 6. Its historical status. 7. Its scien- tific status. 8. The teacher's concern with the theory.	
 CHAPTER III—HISTORY OF SECONDARY CURRICU- LUMS SINCE THE RENAISSANCE	 45
BY G. L. JACKSON, PH.D. (Columbia), <i>Assistant Professor of the History of Education, University of Michigan.</i>	
1. Aim of chapter. 2. Greek education. 3. Roman educa- tion. 4. Mediæval education. 5. The Renaissance. 6. The sixteenth century 7. Sturtevant's curriculum. 8. Predominance	

of Latin in the secondary school. 9. Secondary schools of the seventeenth century. 10. Reaction from the Reformation, Puritanism, Pietism, Jansenism. 11. Reaction results in three types of secondary schools, Ritter-Akademien, Real-Schule, Academy. 12. Study of classics urged upon psychological grounds. 13. Influence of Rousseau upon secondary education. 14. German secondary education. 15. English secondary education. 16. French secondary education. 17. The American academy of the nineteenth century. 18. The development of the high school. 19. High school course of study. 20. Relation between the high school and the college. 21. Different types of high schools.

CHAPTER IV—PRINCIPLES AND PLANS FOR REORGANIZING SECONDARY EDUCATION . . . 67

By CALVIN OLIN DAVIS, PH.D. (Harvard), *Assistant Professor of Education, University of Michigan.*

1. The irrational and wasteful methods of present-day organization and administration historically, psychologically, and logically considered. 2. Recent attempts at improvement. 3. The "bill of indictment." 4. The plexus of evils in the seventh and eighth grades. 5. Plans for reorganizing the system. 6. The six and six division. 7. The five groups of pupils to be considered. 8. The resulting five fundamental courses of study. 9. The four general plans for organizing and administering the six-year high school. 10. Advantages of the new plan. 11. The six-year curriculum. 12. A suggested course of study. 13. Concluding arguments.

CHAPTER V—INSTRUCTION: ITS ORGANIZATION AND CONTROL 106

By EDWARD C. ELLIOTT, PH.D. (Columbia), *Professor of Education, University of Wisconsin.*

1. The meaning and nature of control. 2. The function of school control. 3. The forms of external control; (a) legislative, (b) administrative, (c) supervisory, (d) inspectorial. 4. Three aims of subject-matter; the programme of studies; the curriculum; the course of study; relation of aims to the forms of control. 5. Plans and specifications of instruction; the function of

CONTENTS

XV

PAGE

control. 6. Inspectorial control of instruction; State school systems and higher institutions. 7. Internal control of instruction; relation of principals and superintendents thereto. 8. Teachers, their preparation and selection. 9. Material equipment for instruction. 10. Text-books; selection; free. 11. Supervisory control of instruction; efficiency of instruction. 12. Pupils; preparation; curriculums and courses of study for; tests of attainment.

NOTE.—Each of the following chapters treat their respective subjects in such a way as to furnish some information and many suggestions. They are primarily for teachers in service and for prospective teachers in normal schools, colleges, and educational departments of universities. The life purposes of high school students constitute the ultimate objects of reference—not college admission standards.

CHAPTER VI—MATHEMATICS 128

BY L. C. KARPINSKI, PH.D. (Strassburg), *Assistant Professor of Mathematics, University of Michigan.*

1. Historical treatment of the place of mathematics in instruction. 2. The present practical bearing. 3. The natural appeal of mathematics. 4. Its intimate connection with many fields of human activity. 5. A plea for closer correlation among the various branches of mathematics. 6. More adequate preparation on the part of teachers, in subject matter and methods of presentation. 7. Suggested changes mainly along the lines of simplification and correlation of material now employed.

CHAPTER VII—PHYSICS 146

BY FREDERICK EDWARD KESTER, PH.D. (Cornell), *Head of Department of Physics, University of Kansas.*

1. Physics, its elements of interest. 2. Its fundamental processes. 3. Its practical and pedagogical values. 4. History of the physics course in the high school. 5. Some recent definitions of the proper content of the course. 6. Criticisms, pro and con, of these definitions. 7. Probable future of the course. 8. The training of physics teachers.

CHAPTER VIII—CHEMISTRY 183

By J. E. MILLS, PH.D. (North Carolina), *formerly Associate Professor of Chemistry, University of North Carolina.*

1. Should chemistry be taught in the high schools? 2. The past and present status of chemistry in the high schools.
3. Difficulties in the way of successful teaching of chemistry.
4. Suggestions as to the teaching of chemistry. 5. Suggestions as to the laboratory equipment. 6. Suggestions as to the laboratory work. 7. Time and position to be allotted to the course in chemistry. 8. The equipment of the teacher. 9. Text-books and reference books.

CHAPTER IX—BIOLOGY 198

By ARTHUR S. PEARSE, PH.D. (Harvard), *formerly Assistant Professor of Zoology, University of Michigan; Associate Professor of Biology, St. Louis University School of Medicine.*

1. Importance of biology. 2. Its history in the high schools of the United States. 3. Present status of biology in the high school. 4. Obstacles to successful teaching.

CHAPTER X—PHYSIOGRAPHY 212

By WILLIAM J. SUTHERLAND, A.M. (Wisconsin), *President State Normal School, Platteville, Wisconsin.*

1. Physiography defined. 2. Scientific character of physiography. 3. New method in physiography. 4. Applied science in secondary schools. 5. Summary of geographical characters and function of physiography. 6. Practical value and social phase of geographical knowledge. 7. Physiographic texts, changes, old and new contrasted. 8. Geographical laboratories. 9. Educational value of physiography. 10. Physiography in curriculum; justification as pure or applied science. 11. Introductory and correlative functions of physiography. 12. Physiography and physical geography, distinction. 13. Theoretical value of earth science. 14. A better method in physiography. 15. Need of well-prepared teachers in physiography. 16. Physiography, promise of future.

CONTENTS

xvii

PAGE

CHAPTER XI—ENGLISH 226

BY JOSEPH VILLIERS DENNEY, A.M. (Michigan), *Dean of the College of Arts, Philosophy, and Science, and Professor of English, Ohio State University.*

1. The purpose of English study. 2. Fundamental principle of method. 3. The training of the imagination. 4. Ideals of English study. 5. Present pedagogical beliefs. 6. Text-book presentation of composition. 7. Teaching the English classics. 8. The use of the class-hour. 9. Preparation of the teacher. 10. General scheme of the English course. 11. Selection of reading.

CHAPTER XII—PUBLIC SPEAKING AND VOICE TRAINING 244

BY DWIGHT E. WATKINS, A.M. (Michigan), *Department of Public Speaking, Knox College.*

1. Practical value of public speaking. 2. When it should be taught. 3. Relation to study for the professions. 4. Relation to civics. 5. Cultivation of leadership. 6. Oral interpretation of literature. 7. Vocal atrophy. 8. Training of the emotions. 9. Training of the will. 10. General improvement in instruction. 11. The debate. 12. The oratorical contest. 13. The dramatic club. 14. General tendencies. 15. Lack of uniformity in instruction. 16. Resolutions of the Illinois Association of Teachers of English. 17. Preparation of the teacher. 18. Outlook for the future.

CHAPTER XIII—LATIN 257

BY ARTHUR TAPPAN WALKER, PH.D. (Chicago), *Head of Latin Department, University of Kansas.*

1. Aims of Latin study. 2. Ability to read Latin. 3. Disciplinary value. 4. Value for pupils' English. 5. Literary and historical value. 6. The course of study. 7. Report of commission on entrance requirements. 8. Translation at sight. 9. Choice of reading material. 10. Latin composition. 11. Formal grammar study. 12. Training of the teacher. 13. Minimum preparation. 14. Adequate preparation.

	PAGE
CHAPTER XIV—MODERN LANGUAGES	277

BY W. H. CARRUTH, PH.D. (Harvard), *Head of Department of German, University of Kansas.*

1. Time for beginning. 2. Inductive method. 3. Natural method. 4. Reform method. 5. Text-books. 6. Illustrative material. 7. Preparation of teacher. 8. Outlined courses.

CHAPTER XV—HISTORY, CIVIL GOVERNMENT, AND POLITICAL ECONOMY	288
--	-----

BY WAYLAND J. CHASE, A.M. (Brown), *Associate Professor of History, University of Wisconsin.*

1. Importance of the study of history, civil government, and political economy. 2. The general recognition of the value of these studies. 3. The place of history in the high school curriculum. 4. Methods of teaching history. 5. Aids in the teaching of history. 6. Special aspects of the teaching of civil government. 7. Special aspects in the teaching of political economy. 8. The qualifications demanded of the teacher of history. 9. The preparation of the teacher of history.

CHAPTER XVI—DRAWING, FREE-HAND AND ME- CHANICAL	304
--	-----

BY WALTER SARGENT, *Professor of Fine and Industrial Art in Relation to Education, Chicago University.*

1. Educational and industrial significance of art. 2. Value of mechanical drawing. 3. History of art in American schools. 4. Educational values of free-hand drawing, of mechanical drawing, and of design. 5. Courses and reasonable standards of attainment. 6. Preparation to be expected in elementary schools. 7. Time and credits allowed to drawing. 8. Importance of drawing in mechanical pursuits and in developing public taste. 9. The training of the teacher of drawing.

CONTENTS

xix

PAGE

CHAPTER XVII—MUSIC IN THE HIGH SCHOOL . 317

BY CHARLES HUBERT FARNSWORTH, *Professor of Music, Teachers College, Columbia University.*

1. What music courses in high schools should be. 2. Music compared with other art subjects. 3. The spirit of modern teaching wrong. 4. How teaching of music may be improved. 5. Estimate of aesthetics as a study. 6. Standards of music preparation. 7. Plan for chorus work. 8. Justification for sight-singing discipline. 9. Appreciation courses. 10. Plan for appreciation courses. Credits. 11. Courses in harmony, composition, and voice. 12. Musical clubs. 13. Utilization and recognition of private study outside of school. 14. Temperament and training of teachers.

CHAPTER XVIII—MORAL EDUCATION AND TRAINING WITH A SUGGESTED COURSE OF STUDY 332

BY W. B. ARBAUGH, A.M. (Michigan), *Superintendent of Schools, Ypsilanti, Michigan.*

1. Need of moral culture in the schools. 2. Importance of moral training in modern life. 3. Moral element in education needs emphasizing. 4. Some aspects of the general problem. 5. Methods of instruction. 6. Programme of study.

CHAPTER XIX—PHYSIOLOGY AND HYGIENE . . . 346

BY CHARLES SCOTT BERRY, PH.D. (Harvard), *Assistant Professor of Education, University of Michigan.*

1. Present-day interest in physical education. 2. Physiology and hygiene in the high school curriculum. 3. Beginning of movement. 4. Reasons for failure. 5. Present status of subject. 6. Medical inspection. 7. Revival of interest in physical education. 8. Present methods of organization. 9. Nature course. 10. Training of teacher.

CHAPTER XX—SEX PEDAGOGY IN THE HIGH SCHOOL 361

BY ALDRED SCOTT WARTHIN, PH.D., M.D. (Michigan), *Professor of Pathology and Director of the Pathological Laboratories in the University of Michigan.*

1. Sex problem. 2. Attitude of modern society toward the reproductive function. 3. Failure of parents to teach their children the most important things of life. 4. Results of ignorance concerning sexual matters as shown in the increase of the social evil and venereal diseases. 5. Awakening demand for a change of attitude. 6. American parents beginning to look to the schools for help. 7. Methods of attacking the sex problem. 8. What should be taught. 9. Methods of teaching. 10. By whom should it be taught. 11. Constructive teaching. 12. The teaching of anatomic and physiologic facts. 13. Utilization of courses in botany and zoology. 14. Idealization of the sex relationships. 15. Self-abuse. 16. Chastity and health. 17. Significance of puberty. 18. Preventive teaching. 19. Results of sexual promiscuity. 20. Venereal diseases. 21. Common-sense recognition of cause and effect. 22. Physical evils of sexual promiscuity. 23. General character of such teaching. 24. Significance of prostitution. 25. Degenerative effects of unrestrained lust. 26. High school problems.

CHAPTER XXI—AGRICULTURE 381

BY C. H. ROBISON, PH.D. (Columbia), *State Normal School, Upper Montclair, N. J.*

1. Agriculture in the educational system. 2. Aims and methods. 3. Disciplinary values. 4. Relation to grade work. 5. Present status. 6. College entrance. 7. Agriculture in the curriculum. 8. The one-year course. 9. The longer course. 10. Its differentiation. 11. Correlation. 12. Texts. 13. Apparatus. 14. Time. 15. Teachers.

NOTE.—In the chapter on agriculture an attempt has been made to give some idea of its growth in the high school, and to state some of its problems and the differing opinions regarding their solution. To some extent these are problems of general education, of science instruction, and to a large extent, of industrial and vocational education—for of course these two terms

are not synonymous. Even the very brief treatment of these phases has not permitted any attention to the interesting economic and sociological questions so intimately connected in the public mind with the introduction of agriculture into the curriculum.

CHAPTER XXII—COMMERCIAL EDUCATION . . . 396

BY SELBY A. MORAN, B.L. (Michigan), *Teacher of Commercial Subjects, Ann Arbor High School, and Principal of Stenographic Institute, Ann Arbor, Michigan.*

1. Introductory. 2. Aims. 3. Character and success of commercial education. 4. Subjects in the course. 5. Importance of stenography. 6. Text-books. 7. Office exhibits. 8. Preliminary preparation. 9. Obstacles to be overcome.

CHAPTER XXIII—VOCATIONAL TRAINING IN THE HIGH SCHOOL, AND ITS RELATION TO MANUAL TRAINING . . . 409

BY E. C. WARRINER, A.B. (Michigan), *Superintendent of Schools, Saginaw, Michigan.*

1. Demand for vocational training. 2. Present-day tendencies. 3. Need for vocational training. 4. Duty of the State. 5. Vocational training in the high school. 6. Practical difficulties. 7. Co-operation between high school and factory. 8. Technical arts high schools. 9. Three lines of tendency. 10. Result of vocational trend in education. 11. Vocational guidance.

CHAPTER XXIV—PRACTICAL ARTS FOR GIRLS . 428

BY CHARLOTTE JOY FARNSWORTH, A.B. (Wellesley), *Preceptress of Teachers College, Columbia University.*

1. Theoretical and practical subjects in the high school. 2. Need for new valuation. 3. A course of study. 4. Economics of clothing. 5. Planning an allowance. 6. The Study of textile materials. 7. How to shop to advantage. 8. Household sanitation and management. 9. Fundamental principles. 10. Home care of sick. 11. Emergency work. 12. House furnishing. 13. Principles underlying good taste and economy.

14. Social relations and conduct. 15. How to increase effectiveness and pleasure when individuals meet. 16. Recreation and enjoyment. 17. Value of plan versus drift in our leisure time.

CHAPTER XXV—PSYCHOLOGY IN THE HIGH SCHOOL CURRICULUM 441

BY IRVING MILLER, PH.D. (Chicago), *Professor of the Science of Education, State Teachers' College, Greeley, Colorado.*

1. Present-day interest in psychology. 2. A central science.
3. Varied relations to life illustrated on both theoretical and practical sides. 4. Newer trend in psychology—its independence of philosophy. 5. Its scientific character. 6. Biological and functional point of view. 7. Early recognition in secondary education. 8. Present status in high schools. 9. Value of non-professional basis, cultural, moral, and religious, in relation to mental control. 10. Text-books and other aids to study; current improvements, choice of books. 11. Suggestions on methods. 12. Future of subject in high schools.

CHAPTER XXVI—THE HIGH SCHOOL LIBRARY . 460

BY THEODORE KOCH, A.M. (Harvard), *Librarian, University of Michigan.*

1. Importance of problem. 2. Growth of high school libraries. 3. Library work *vs.* teaching. 4. Difference between school library and public library. 5. Duties of the librarian. 6. Assistance for the librarian. 7. Purposes of a school library. 8. Teaching the use of the library. 9. Ignorance of average pupil concerning books. 10. Library instruction. 11. Specimen questions concerning books and their use. 12. Some things a teacher should know about books and libraries. 13. Library courses. 14. Value of library instruction. 15. Importance of early acquaintance with books as tools.

BIBLIOGRAPHY 471

APPENDIX 533

INDEX 547

HIGH SCHOOL EDUCATION

CHAPTER I

CURRENT DEMANDS UPON THE PROGRAMME OF STUDIES¹

CHARLES HUGHES JOHNSTON, PH.D.

DEAN OF SCHOOL OF EDUCATION, UNIVERSITY OF KANSAS

The High School Programme.—A modicum of educational theory, half articulate, but disentangled from the great mass of historical tradition and social prejudice, doubtless functions feebly in the minds of those who select and organize programmes of studies for high schools. The needs of high schools, their relations to the college, the professions, and the vocations figure increasingly in this educational frameworking of the last decade. Technical skill, constructive professional ideals, and cultural and moral demands are conspicuously emphasized in various types of discussions of the curriculum content and the social function of secondary education. Wide-spread and often adversely critical public concern in this question of the content of the course makes more urgent the necessity of co-operation among those who can effectively and comprehensively survey and take inventory of the available resources. The public high school is in a critically vital stage of its evolution. Historic forces in our educational development have forced upon this comparatively young institution ideals remote from the common man. Even the most respectable of

¹ Consult chapter V for the officially adopted usage of "programme of studies," "curriculum," and "course of study."

its courses seem to this aroused and thoughtful public to represent undue and irrationally difficult peculiarities, to be ineffective in attainments which pass counter in the actual moral or industrial world, and to be bent upon enforcing unattainable scholastic standards. These standards are thought indeed to smack of intellectual luxury, to be narrow, stereotyped, and undemocratic. There is no considerable prejudice against "unescapable conditions of scholarship and intellectual living." There is, however, coming into vigorous existence a social conscience which will soon brook no dallying with the likewise unescapable school functions of insuring economic efficiency, sounder moral integrity, and perhaps a measure of æsthetic development. The rise and fall of the curve which indicates graphically the popularity and predominance of certain high school studies correlates too closely with changing college admission requirements for us to point historically to any healthy, self-orienting characteristics within the high school organizations themselves. This is past history, however. The high school will henceforth make history. It is clambering to its feet. Its leaders are organizing the resources for combined or at least co-operative attack upon the varied community issues. The multiplicity and complexity of the problems furnish a magnificent, urgent, and inspiring challenge.

Co-operation between High School and College.—It is said that the typical college man preserves history and tradition; that the typical school man makes history and tradition; and that their sympathies as well as their functions are diverse and antagonistic. This has apparently been so; it is not so now. Because of a great social pressure we all note the growing spirit of co-operation between the schools and the colleges—a new brotherhood

of educational workers. "Time was when the college was a kind of Olympus and the public school a lower region. Once each college went on its own way without consultation with school authorities and without regard to school conditions, but the continual advance in scholarship and in professional insight among public-school teachers has wrought a change of attitude."¹ Now very many of our secondary teachers are scholars and have done a considerable amount of graduate work. There is no longer a great gulf fixed between the college and the high school. This growth into a closer, more cordial relationship enables us to say that the school and the college are directing different parts of the same process. It enables President Pritchett, of the Carnegie Foundation, to say that the policy of higher educational institutions is now marked by two important facts: (1) Freedom for the school in the choice of studies and methods, so that it may make its work adaptable to all who resort to it, most of whom do not enter college; (2) insistence by the college that the student in the school attain an adequate intellectual training irrespective of the details of how it may be procured. In short, we may look forward to the day when the school shall have gained such efficiency and strength that it can stand alone in its curriculum making and not have to swim with the cork of supervision and college examination. This will mark the establishment of an honor system between schools and colleges, and is clearly foreshadowed in the most recent modifications of college admission requirements by even Harvard, the University of Chicago, and the University of Pennsylvania.

Social Conditions Change the Programme of Studies.—The most delicate, yet the most urgent and most difficult

¹ This from the dean of one of our universities.

task before schoolmen to-day is this: How effect the necessary changes in the material of instruction, the programme of studies, without too much harmful disorganization and confusion. I introduce my discussion as I have to suggest at the outset that this problem will have to be worked out by high school leaders on the ground, not without agonizing thought and most likely some costly experimentation. Such discussions as this book contains will offer some constructive conceptions and will aid in stating leading issues. The actual national, State, city, and local systems must always be the testing crucibles in the evolution of a workable plan.

Let us attempt to define the social condition for which we must modify or enlarge our programme of studies and our high school ideal.

Education means something it has never meant before. We have only to enumerate the kinds of education that society calls into existence if we wish to face concrete issues. In this way we may anticipate some of the adaptations to which the future high school must conform. Kinds of semi-private educational institutions exist for almost every profession, religious belief, or social tenet. No one has had the temerity to suggest a classification nor to analyze the *vague social consciousness which calls them into existence*. Research, religious, ethical, commercial, industrial, vocational, supervisional, reformatory, cultural, disciplinary, avowedly professional, purely charitable, propagandish—and freakish types may be partially characteristic of many phases of concrete mental activity called, nowadays, educational. All these social experiments have their effect upon prevailing educational opinion. *En masse* they constitute our educational era. Whatever of permanence attaches to these spontaneous

reachings for things educational we must eventually incorporate in some type of public secondary school institution.

Variety of Existing Educational Institutions and Activities.—The extension of university privileges at all times to teachers of both sexes at the Universities of London, Harvard, Pennsylvania, Cincinnati, etc., the National University (suggested), numerous new institutions for research, evening Y. M. C. A. universities, international congresses, national exchanges of professors and middle school teachers, parents' co-operative associations, an international academy as an authority on language reform (suggested), exclusive Catholic and Jewish schools, national and State schools for grown immigrants, schools for health instruction of soldiers (England), State schools for veterinary surgery (suggested), Farmers' Experimental College on Wheels (Booker Washington), army cooking schools, special schools for ophthalmology, otology, rhinology, laryngology, etc. (suggested in lieu of recent organized agitation for adequate medical supervision of school children), constitute an arbitrary choice from our long list. Extending further the connotation of education, and enormously increasing our perplexity, we may note many less comprehensive phases, some genuine, some abortive, all characteristic of our age and exigencies of our growth. We note, further, schools for religious pedagogy, schools for deaconesses, the great evening trade-schools of Boston, New York, Chicago, and Philadelphia, Southern industrial schools for negroes, evening high schools, agricultural high schools, high schools of commerce, manual training schools, Lyman and other city reform schools, the George Junior Republic, the Rand and other schools of social science,

schools for socialism, breadwinners' colleges, home schools for Jewish girls, truant schools for girls, schools for incorrigible boys, schools for crippled and deformed children, schools for old people, schools for training in prevalent ailments of low humanity (Washington Booth's suggestion), the Department of Humanity in Columbia University, and even schools for anarchy. And if this be not enough, our list runs on freely with various struggling attempts at vocational schools for journalists, for librarians, for salesmen and saleswomen, for judges (Paris), for cash-boys, for nurse-maids (London), for policemen (Russia), for grave-diggers (Belgium), for housewifery (England), for prospective wives and husbands (suggested), for washerwomen, and even for chimney-sweepers (Prussia), for *croupiers* (Monte Carlo), and for aeronauts (Boston). By continuing such a survey we may get an appalling picture of actuality, a semi-civilized situation replete with suggestions, whose ultimate résumé will be impossible until philosophy is as broad as life, and until educational endeavors can more successfully cope with genuine social imperfections. One great philosopher has said that confusion, tantalizing and agonizing very often, is the price we pay for subsequent charity. The pan-sophic ideals of Luther, or Bacon, or Comenius, will not avail us here. What *Education* is I am not rash enough to say. That the term connotes more than it has connoted for any other age is assuredly evident. Neither Plato, nor Quintilian, nor Locke, nor Spencer, nor even Rousseau, faced, much less solved, our present-day problems. Their simple naïve devices and absolute dicta were meant for an earlier time and a simpler civilization.

Industrial Training.—Of the problems pressing upon schoolmen in actual service, the one of industrial train-

ing is typical and urgent. The list of the vocational schools in the city of Munich will sufficiently emphasize the probable complexity of our educational future in this respect. This one city assumes responsibility for its citizens by directing forty-two vocational schools with organized courses of study bearing upon the trades in question. These are schools for butchers, bakers, shoemakers, barbers, wood turners, glaziers, gardeners, confectioners, wagon makers, blacksmiths, tailors, photographers, interior decorators, hotel and restaurant waiters, coachmen, painters, bookbinders, paper hangers, potters and stove setters, watch-makers, clock-makers, jewellers, goldsmiths and silversmiths, founders, pewterers, copper-smiths, stucco workers and marble workers, wood carvers, coopers, saddlers and leather workers, business apprentices, printers and typesetters, lithographers and engravers, building iron and ornamental iron workers, machine makers, mechanics, cabinet-makers, masons and stone cutters, and carpenters. All these courses of study were forced into existence in this city between the years 1900 and 1905.

A supplementary list of novel ideas as regards the course of study are the following: A course in the humane treatment of animals required by law in Illinois, School of Peace (Boston), consular schools of commerce and administration (Chicago), Cantonal Commercial School (Zürich), schools for railroad men with elaborate curriculum (P. R., R. etc.), schools for mine workers (Lost Creek), department of Life-saving (Columbia University), department of Horsemanship (Norwich University), schools for real estate dealers (Y. M. C. A. University, Boston), European hotel schools, School for Household Arts (Barnard), Wifehood Guild (Long Isl-

and), travelling cooking schools (Germany), schools for "Intellectual Elite" (this principle is in operation in one large city), Bureau of Hygiene (to teach mothers infantile diseases, etc.), schools for "wet" voters in St. Louis to instruct in use of ballot, the Caroline Rest for mothers (course in the care of babies, Chicago), elective course in care of babies (Missouri), schools for tubercular children, cigar schools (Belgium), schools for coast defence (Virginia), school hygiene clinics for the study of typical ailments of school children (Scotland), trade hygienic institutes for workmen in typical ailments of occupations (Germany), schools for deportment, telephone sweet-voice schools (Los Angeles), courses in railroad problems (University of Illinois—proposed), City Fire College (New York), high school course in "Civic and Industrial Chicago" (Chicago), schools for waiters (three in London), School for Women Police (Kansas City), and School for Municipal Administration (Columbia University—proposed).

This list is suggestive, but not complete. We have ninety-seven distinctive fields into which educators are driven by the public to enter. One hundred and thirty-seven courses are mostly concerned with processes which we have not heretofore thought of as educational. It all seems to mean that we have rapidly democratized education. It seems to mean that wherever the torch-light of education does not yet shine, we are going to hear the "voice in the wilderness crying." Indeed it is natural for us to suppose that our list of public school failures will greatly increase just because we have educated the public up to the point of demanding more. If Hale claims it does not insure morality; Eliot that it is not worth the money spent; Admiral Evans that its individual results

are contemptible; Fiske that it is useless for business; Edison that it is useless in the world of applied sciences; A. C. Benson and Frederick Harrison that it is a machine for destroying individual leadership; Rabbi Hirsch that it is a typical failure as a twentieth century institution, we can reply that these criticisms are a natural outcome and an encouraging symptom. Some day the ideal of the public school will evolve.¹

Public Support for Real Needs.—The public is willing to support what the public very clearly needs. Industrial items, utility items, including agricultural, are most clearly seen. Sociological necessities, in the broad sense of making a more efficient voting class, are next in order. Biological motives and principles in the modern hygienic sense, the art of sanitary observance, preventive medicine, and increase of physical effectiveness, come next. Then there is a drop to those we may call religious items in a non-sectarian sense; and then to those psychological in the sense of the necessity that the school shall understand and observe the individual types under its direction. Then, whatever the ideal order may be, comes the æsthetic, in the sense of equipment for life's leisure hours; the luxury side of education. Lastly in popular importance comes the administrative in the sense of economical business methods, a lack of waste and friction in school machinery, an understanding of retardation and promotion, and the very great problems of equitable and permanent principles of taxation. This is doubtless a fair index of our social, or as many call it, our democratic consciousness. Vaguely as yet are our school workers sensing these many voices. Slowly are school move-

¹ This list has been adapted from an article by the writer which appeared in the *Educational Review*, February, 1909, pp. 160-180.

ments just now squaring themselves with all these real issues. Society, which supports our public system of schools creates its demands as it feels them; industrial efficiency, twentieth century morality, and a health conscience with regard to one's self and one's neighbors, the demand for beauty in one's own environment; these are the things it desires at present. How conceive our programme of studies and how remodel our curriculums that the changes called for may make for permanent and not abortive development?

The Issues before the Schools.—It is clear that certain great issues stand out for those who organize our school courses of study. They are these: How choose and arrange courses that the curriculums will best minister to all pressing industrial and life needs of the pupils, including agricultural demands as well as all other manual occupations? Again, how make a programme of studies affect more directly the national observance of hygienic living? How make healthful living fashionable? Again, how make what we deal out in our courses of study more clearly bring into favor a moral standard which will guide us in the genuine perplexities of right acting under twentieth century sociological conditions? Next—not yet an issue for most of us except in a narrow personal way—how shall our courses affect the individual and the public taste; how make art a necessity of life? Again, how conceive our courses and plan them that we can adapt educational material so that we may detect, direct, and preserve the individual differences in our own students? Lastly perhaps, how can we arrange our accidental division of eight-year elementary and four-year high school programme into the equal six-year division?

Planning a Course of Study.—The planning of a course of study is not entirely, not chiefly indeed, a technical, mechanical, administrative issue. It is easy to apply exact treatment and method to physical machinery, chemical elements of soils, timber supply, water power, dynamo functions, or to labor supply, but students, school material, demand much more than this quantitative and lumped sort of treatment. We have studied and to a certain extent mastered the administrative machinery and have clearly named some of its problems. Now we should study intensively the functions of curriculums themselves. So much merely to say that our task is a reorganization of the programme of studies. Inevitably then we should consider (1) these programmes of studies historically; (2) the modern criticism directed against our present one; (3) fundamental ideals which influence its development; and (4) certain constructive suggestions which bear promise. These in detail are to be found in the chapters which follow.

Development of the Curriculum.—At first the American school is a slavish imitation of European models. Like those of England and Scotland, it represents only provincial issues. Later our schools adapt themselves in bewilderment to a split society, and vaguely enlarge the curriculum. The grammar schools overlap private academies. After the Revolution democracy makes universities for the people. Borne in on the same wave comes the elementary school. In the first quarter of the nineteenth century the American high school appears. These movements are hesitating attempts to knit rich and poor in democratic unity, rather than, by anticipating society's differentiations, to equip each for his probable needs. All this was in part French Revolutionary sentiment

rather than common sense. This administrative treatment resulted in the ladder logic, all marching toward the university apex. In fifty years States take control of these movements. With the school system on its feet administratively, we next note the throes of internal organization, external articulation, and unmanageable curriculums. Blind alleys, waste and lack of universal appeal produce slogans for reform. At this point historically the single curriculum is superficial and artificial. State universities (Michigan for example) were on foundations which enabled them to pattern after German universities and institutions like Harvard. Naturally at first what directions the schools did get were largely in the nature of superimposed tasks. This sort of guidance, good in part, and all of any sort at command, could not prevent the resultant artificiality in many of the courses of study. Colleges then became lenient and the accrediting system of the Middle West relieved the pressure in the high school, but added a grade and promotion machinery to the elementary schools. Popularized science and vaguely conceived humanitarian studies confused still more the bewildered curriculum makers. Then later the attempt to give every subject social significance, as Dewey preached, added naturally to the confusion. Indeed, throughout the history of the programme of studies even good suggestions have proved disorganizing and costly. Like "growing pains," however, they are symptomatic of progress.

At present we are hearing on all sides from the proponents of vocational education. At recent State teachers' associations it appears, from the agricultural culture urged, that we are all immediately destined to return intelligently to the soil. M. E. Sadler and his thirty col-

laborators, after an elaborate world survey,¹ prophesy a complete reorganization of the years of public school life, and the incorporation of direct moral education in the secondary curriculum. E. S. Draper, of New York State, has already instituted far-reaching reforms in specific directions. Massachusetts disturbs at present only the high school organization and the upper grammar grades.

Criticism of Modern Public School Education.—Destructive critics see moral perverseness and intellectual obtuseness underneath the whole reconstructive modern movement. Constructive critics see it all as a vital fact, an exigency in a nation's quick growth, an inevitable stage of possible development. The process is not idealized, nor is it conscious of itself from within. The secondary school, though we boast of it as a democratic institution, has not the first mark of such. It is not self-orienting. With so many perspectives, none are compelling. All suggested clews are somewhere followed up regardless of their source. But there is little conservation of good or bad experiments, of educational experience; no secure and confident attitude toward criticism and advice; no unswerving devotion to an articulate educational ideal similar to the moving conceptions which lie at the basis, for example, of Plato's "Republic."

The colleges and universities have had no time to study the problems, and the merely formal method of training polishes the superficiality. As David Snedden observes, historically the chief function of the American college, so far as practical occupations are concerned, has been the preparation of teachers. More of its graduates have gone into this than into any other field, yet until recently it could be said that the colleges refused to recognize that

¹ "Continuation Schools in England and Elsewhere."

teaching in the high schools was a profession in spite of the fact that its graduates in such numbers were making a career of it. The public has been obliged to accept this opinion only to find their preparation incomplete and their first years of apprenticeship in many cases wasteful. This is a part of the unsatisfactory history of the development of the curriculums. It is now all past. An historical survey shows that one is less and less likely to see any college trying to dictate secondary programmes of studies. Indeed history shows that our curriculum makers are driven more and more to look to local clews, retaining as anchorage a few fundamental but simple educational principles, and a sound appreciation of elementary life problems.

Signs of Improvement in Our Educational System.—We should hence turn to the instructional and more scientific field where we may see certain constructive conceptions and ideals which bid fair soon to be incorporated in our educational system. Certain big ideals are slowly becoming articulate for us, upon which our curriculums and courses will ultimately rest. The simplified principles of hygienic and sanitary enlightenment and preventive medicine, inculcated with strong aspirations to acquire the goal of physical uprightness, will probably furnish material for a continuous graded course of study throughout the elementary and high school, which will aim not at an initiation into the technical sciences, but, with the help of the gymnasium and athletic field as laboratories, at furnishing the reliant basis and impetus for the art of living. Outside pressure is forcing this upon the school. A physical conscience must be and will be simply but persistently developed. Again, the incipient stages of the æsthetic experience, the natural and unrestricted

approach to the beautiful, will soon cease to be the detached and exclusive privilege of those only who can defy school standards. Teachers, however, in order to conserve such mental characteristics, must live in the world of the beautiful themselves. This art principle in school work must establish itself pedagogically and universally. Hundreds of isolated experiments prove the desirability and the practicability of this step also. It will come when higher institutions can inculcate the art spirit in embryo teachers, and when teaching itself is entered upon as a noble art and not as a job—and when we can see more nearly equalized the conditions for teaching all along the line. With this, and because of this, a simpler, clearer, and less ambitious intellectual attainment, carefully and without haste, will be undertaken with more dignified composure. With this curtailing of costly luxuries, and extravagant exploitation in our curriculum, it will come about naturally that emphasis upon the bizarre occurrences of the recitation period will weaken, and will be replaced by the much desired emphasis upon protracted, unswerving, and delicately skilful direction in the automatization of those fundamental activities, relatively few in number, which stand one in stead in either cultural or vocational crises. Bagley has recently shown ¹ clearly that secondary intellectual training too often stops short of the point where self-mastery of the finer acquisitions in any specific disciplines may be accomplished. The motivation, the worth-whileness of the effort to attain fine capacity through intellectual disciplines, is lacking. The reason for this resides in the condition. There is a confusion and a vagueness in the high school incentives to this conscious effortful mastery

¹ Cf. *School Review*, February, 1911.

of a process. Success here also involves and implies the practice in and the anticipation during the school period of civic and personal virtues, moral training, if not for a time direct moral instruction. Such bases will both shorten and enrich the programme of studies, make for professional pride and loyalty in teachers, and recognize the *in loco parentis* function of the school, which also seems just now to be its unavoidable duty.

Analysis of Aims and Individual Differences Urgent.—

The high school teacher must know more intimately and appreciate more critically his or her charges who are going through vital physical, mental, and spiritual changes which make or mar, tone up or discolor, sweeten or embitter their whole after lives. The uncontrollable, inarticulate, but ceaselessly active undercurrent of passion and latent power is there—critical for the educator. Not only sanity, kindness, and justice, but studied insight into the meaning and critical importance of these vital changes must be at command. For one cannot any longer retain self-respect if he accepts his teaching work as merely the imparting of information. He is more and more insistently challenged to make men and women and to study continually the intricate complexities of those processes he by virtue of his position must direct and refine. School administrators and all teachers in the ranks must formulate more concisely, then carry out, a clean-cut policy with reference to the genuine and concrete issue suggested above.

Lack of Agreement among Educators.—For example, the writer, in order to compare professional opinion as to how to introduce hygienic instruction, sanitation, and preventive medicine into high schools, devised a questionnaire which suggested these four possible solutions:

"Would you have this work given (a) independently in systematic short courses, or (b) in connection with biology and physiology, or (c) in an independent course in morals, which course would include laws and duties of health, of sex, physical and moral purity, and also the principles of honor, manners, patriotism, social responsibilities, justice, etc., or (d) would you have it left to some other agency?" In all likelihood the four ways suggested, which seem to be about equally favored, since no one *knows*, will each be pretty fully exploited before the general adoption permanently of any one of them. The great numbers of answers from supposedly educational experts illustrated by their diversity our inability to settle off-hand a single curriculum modification. As with the history of the introduction of any other school subject, costly experimentation is necessary, although we should try to foreshorten the process.

Need for Careful Experiment.—There was about the same division of opinion in London (1907) at the International Congress on Moral Education. Some believe we must teach morals directly in courses; others believe it is best to do so indirectly. Some wish to connect morals with special religious teaching; others wish to keep the two entirely distinct. The problem of moral education in the schools will be solved when we have local experiments by schools furnishing data derived from experience with definite and clearly conceived practices which differ. So it will be with our art courses in the school—courses which are not natural to our curriculum thinking as yet. The ideal art instruction may find itself in some manual training connection, or as a great many others are thinking now, through some introduction to art in elementary courses in the fine arts. Our experimentation and tab-

ulated results will decide the issue. Again, industrial courses are being specifically exploited in Massachusetts, where history is being made. This should save us the same costly experimentation. In Illinois, agricultural education is having a free field. We have here but to observe mistakes to avoid them and effective policies to adopt them. It is pretty likely that Berkeley, California, for example, can give us data with regard to the wisdom of six-year divisions of the elementary and high school.

In short, ours is an educational era of adaptation to local demands and genuine needs, and to the community appeal; and of assumption as to the ability and inclination of the community to appreciate. The consequent confusion, disorganization, and dissatisfaction are a natural outcome, but not a permanent condition of our present stage of development.

Model Schools.—We have existing, partly for this experimental purpose, model schools now in different parts of the world which take a radical stand in order to develop some new feature or type of curriculum. These have been in some disfavor with practical schoolmen because they cannot be copied. This is not their purpose. The Rein School at Jena has saved time for thousands of schools by fully exploiting refined Herbartian methods. The J. J. Findlay Demonstration School at Manchester is doing the same thing in the modern languages in the elementary grades, as well as in other untested school branches. The model school of the Hyannis Normal School is carrying to the extreme the idea of reproducing a miniature democracy in the school society. The Massachusetts industrial schools in certain towns, through their curriculums, are working out for us the practical

problem of adapting all institutions to local needs and specific trade demands. In no other way could we see the fruits of such a policy. The Ethical Culture School in New York City, and the Summer School for Moral Education in Madison, Wisconsin, are also virtually demonstration schools. Samples of work under favorable conditions must be done to test the method of direct moral instruction. The Practice School of the University of Missouri, directed by J. L. Merriam, is an institution which superintendents in Missouri do not find themselves able to duplicate. This school serves other purposes. In the April, 1909, issue of the *Educational Review* Merriam outlines a programme of studies which has fascinating possibilities and the spirit of which I feel sure we should like to duplicate in many particulars, and yet I doubt whether our communities could accustom themselves to supporting schools of the Merriam type yet. His programme of studies is as follows: First three years, playing wholesome games, discovering interesting and profitable things, and making useful and ornamental things; fourth year, local industries, post-office, laundry, grocery, dairy, etc.; fifth and sixth years, industries at large, as lumbering, mining, governing, etc.; and the seventh year, important United States industries. This is not an industrial school, but an elementary school with a vocational flavor; a school where real child motive gets free play and where large tasks are almost unconsciously done, and where the curriculum is not a patchwork of studies. I refer to Merriam's elementary school because it is a good sample of what is meant by experimenting with a programme of studies in a scientific way.

Suggestions for Reform in the Curriculum.—These reforms described above are practically suggestions for a

complete change of front in curriculum-making. Public school machinery and public school forces are too unwieldy, however, to accomplish any such right-about-face. There are less radical proposals which embody practical reforms of our present practice, particularly those aimed at high school reorganization. The Massachusetts Commission on Industrial Education furnishes samples of such modifications which have been adopted at Fitchburg, Lynn, and Waltham. Draper, of New York, has published his proposed changes for the elementary work throughout the State. There is a National Education Association committee at work upon the six-year elementary and high school division. In the *School Review* for March, 1909, one finds in an article by Charles De Garmo, of Cornell, clear-cut suggestions for junior industrial high schools. Many other administrative schemes for special curriculums are interesting and provocative of speculation. But even these ingenious policies are partly blundering guesses, not expressions of settled conviction nor products of actual experience. The real approach to the curriculum problems for our future teachers must be the scholarly one. They should understand and have in mind samples of historical courses of study and curriculums. They should be able to appreciate the social bases upon which these have rested. They should consult various types of model curriculums. Furthermore, they should be able to articulate for themselves the modern bases upon which any course must rest, particularly their own. From this they will be driven to a consideration of the inter-relation of the various subjects in the programme. Again, no high school teacher can be fully proficient without definite relations to his colleagues. Most inexperienced high school teachers at-

tempt to do their work with reference only to their interests in a detached branch of study. Instead they should be conscious professional co-operators in the administration of the whole curriculum. There is every reason why the history teacher, the language teacher, the mathematics teacher, and the science teacher should make specific efforts to articulate the distinctive but mutually dependent functions they are each to perform in the educative process. Here professional distinctiveness and pride will produce efficient co-operation and insure a measure of relatedness hitherto not brought into the service for unity of aim in secondary teaching.

The Variety of Curriculum Problems.—Typical perplexities of the curriculum are easily discovered. One quickly finds certain clear-cut issues prominent. An examination of the model outlines for the high school programmes of studies for the States of Illinois and Michigan and for the cities of New York and Boston reveals the following interesting educational situation: The elective system is a baffling problem everywhere. None have worked it out. The five-period-per-week problem is differently solved by each of these educational bodies of experts. The problem of adapting the course to the sex demands is only partly met. The problem of foreign languages, ancient and modern, is differently solved. Michigan and Illinois both are more conservative in the matter of ancient languages. Boston and New York are making no distinction between a foreign and an ancient language. An observant critic will note further that the material for English courses differs in required content throughout. He will note that grammar in these four pamphlet directions appears in each year of the high school in turn with no apparent reason in any case.

Mathematics is required throughout and appears to offer a point of general agreement, although there are different theories as to its purpose, method, extent, discipline, textbooks, and as to whether it shall be chiefly applied or pure. Differences multiply as we leave the field of exact science. One will have raised in this examination also the question as to whether geography should be a commercial or a physical subject. Of the science of the curriculum, there is no general agreement as to how we shall sequentially relate botany, zoology, general biology, physiology, and hygiene, or as to the order in which we shall give chemistry, physics, and physiography. Drawing seems to be an extra, not worth college credit in some cases, and not rigid, nor difficult, nor systematic. In the foreign languages three years as a rule seem to be expected with wide election provided for college admission. Vocal music is an extra; instrumental music is a school subject that has a questionable status; Illinois suggests agriculture throughout; it appears in the programme of an increasing number of schools and there is a propaganda in Michigan, in Kansas, and other States to adopt this as a State policy. Commercial training appears throughout; domestic training seems to be, for the girls, a substitute for mathematics and physics. Civics, economics, and American history are agreed upon as last year subjects. As to how to conduct the history throughout the high school, there is little consensus in these four schemes. History, if judged by required schedule hours, is relatively little stressed in New York. These are conclusions from a mere statistical analysis of four suggestive programmes. If we should take a German programme we should add the subject of religion; if we should take a French programme we should find a course in morals

with religion debarred. In either we should note more required hours and less elective, we should note more of the classical flavor to the curriculum, and we should see a different division of years for high school work.

The Basis for a Reconstruction of the Curriculum.—In short, schoolmen are driven to a thorough-going reconstruction and reclassification of our standards for educational values and correlations. I quote the following from Professor William Macdonald:¹ "I cannot but think that the public high school has to-day legitimate ground of complaint against the college, especially in the Eastern part of the United States. Broadly speaking, our college entrance requirements are both too high and too narrow. In the attempt to protect Greek, for example, high school Latin has been sometimes undervalued, especially where a scheme of 'units' obtains. French and German have been arbitrarily reckoned as of less worth than the classics, and the whole scheme of entrance requirements has been overweighed with language. The alternatives for Greek or Latin have sometimes been less, and often more, difficult to offer than the language itself; while work in physics and chemistry, though done in school laboratories as good as those of many colleges, and under teachers of sound university training, has been accepted for admission only to be rejected after admission. The entrance history requirement seems to me to be, for the majority of schools, much too difficult, except under peculiarly favorable conditions.

"On the other hand, Eastern colleges have been very slow to accept, and for the most part have declined alto-

¹ *Educational Review*, January, 1911, "The Interest of the Public in the College Curriculum."

gether to accept, a number of subjects which legitimate public demand has introduced into many high schools, and which I am constrained to believe are as well taught as other subjects of the curriculum. Such subjects as physical and commercial geography, industrial history, modern European history, American civil government, household chemistry, and manual and industrial training are not generally accepted as entrance subjects; or, if they are, are commonly taken at a 'unit' value less than they actually stand for in the work of the student. They are not, in other words, quite respectable.

"Unquestionably, there are disparities and maladjustments here that ought not to be continued. The widening range of high school studies, due to the public demand that tax-supported schools shall give adequate preparation for life, together with the increasing dependence of the college upon the high school, rather than upon private schools, for its students, makes imperative a broader basis of admission to college, if a gulf between the two classes of institutions is not to become fixed. Not, let me repeat, that the college must accept everything done in a high school as a suitable preparation for college, or that every high school course is to be accepted by the college irrespective of its content. I do not myself see how the college can ever regard dressmaking, cooking, stenography, typewriting, book-keeping, or sight-singing as substantive elements in college preparation, on which later cultural courses can be built; or how it can surrender to the schools the function of determining what the entrance requirements shall be. The demand that any high school course anywhere shall admit to any college course anywhere seems to me preposterous, both practically and educationally. But we must certainly

broaden the road a good deal if the school and college are to continue, shoulder to shoulder, to do the educational work of the country; and we need not fear lest a broad road lead us to destruction.

“To be specific: I am disposed to think that the colleges generally must make up their minds, as some have already done, to insist upon but one foreign language, ancient or modern, instead of two or three, for admission; provided always that the language offered has been taught long enough and well enough to insure on the part of the student real mastery of it, real ability to use it. Again, the college must bring itself to abandon a protective tariff on traditional subjects, whether Greek or any other, and cease to display ‘alternatives’ which are not at least time equivalents. It ought to increase the ‘unit’ value of history, or else decrease the period to be covered; and it certainly ought to make room for industrial history and the history of modern Europe. It cannot continue to discount the high school work in science, when courses cover the same ground and are done under as satisfactory conditions as corresponding courses in college. And it must accept sound, well-ordered, and well-taught courses in geography, American government, industrial training, and other equally worthy subjects. The adoption of all these changes would in no way jeopardize the scholarship of the college, or deprive it of the control which it ought to have over its own standards, or take from it any means it now possesses of keeping out the unfit. It certainly would not ‘put the colleges at the mercy of the schools.’”

Here we have college opinion falling in line with the evident tendencies in the developments of secondary education, and we have here also a frank recognition of

the necessity that this education find itself more completely through more clearly conceiving the educational possibilities inherent in the materials of instruction.

The High School of the Future.—The general features of our future public high school, "the people's college," have been summed up by A. F. Lange¹ as follows:

"The need of vital continuity and flexibility is that of enlarging the girth of secondary education. Its cultural mission, to begin with, can no longer be fulfilled through the so-called culture studies alone. Little by little we shall doubtless learn to teach mathematics and the sciences, history and civics, literature and the languages so as to start with actual life for knowing and to come back to it for doing, but even then we cannot wisely leave out the subjects that specifically epitomize the economic activities of our contemporary civilization and lead over to the material side of the world's work. What life has ceased to give the school must supply and improve upon. Quite apart from vocational issues, efficient citizenship, the very heart of liberal culture from the view-point of Democracy, demands nowadays a trinity of developed senses—a *vivid historic sense*, the *scientific evolutionary sense*, and a *practical economic sense*. It implies that neither those who can and will prolong their school careers nor those who must cut them short should be deprived of the chance to get and keep in active, intelligent, sympathetic touch with the work and the workers of our farms, our industries, our commerce. Accordingly, no high school is fully adequate to its cultural purposes until it has a department of agriculture, or of commerce, or of the mechanical and domestic arts, a

¹ *University of California Chronicle*, vol. XII, No. 4, "Self-Directed High School Development."

department accessible not only to the incurables but to every student, a department in charge of teachers, every whit as broadly and thoroughly trained and as civilized as those of other departments—ought to be. The universities must further this development by training teachers and by welcoming the student who has had the good fortune or good sense to choose some of the courses in applied knowledge along with the rest. Sweetness and light and overalls are a perfectly feasible and very effective combination. . . . American communities will have to create more vocational schools than hitherto of secondary grade. In the interest, however, of both the individual and of the common weal our educational expansion must be guided by three principles. First, no technical school must be so narrow in aim and scope as to cheat the pupil out of his heritage of race culture as embodied in language and the institutional achievements of his people. Second, no cultural high school must be allowed to become so narrow in aim and scope as to deprive its pupils of the opportunity of acquiring the *economic sense* and of finding themselves and their fellowmen by many-sided doing, related directly at one point or another to the business, or the agriculture, or the industries of the nation. Third, other things being equal, the surest guarantee of living together in the bonds of peace and of advancing together on the road of national destiny is the co-education of all sorts and conditions of young people, and the longer they can be kept together the better for them and the general welfare when their turn comes to constitute the people, the State. . . .

“What the American college of two or three generations ago did for the few, the American high school is called upon to do for the many, only more adequately.

The notch reached by the college before the latter half of the nineteenth century should be the high school teachers' starting-point for measuring high school efficiency. . . . Called and chosen to represent and serve the nation through an institution of this character, high school men and women, self-conscious of their trust, will not fail to see that a secondary teacher must no longer be a second-hand teacher. We all know, of course, how fatal to all concerned it is when a university specialist runs amuck among high schools. But *hari kari* is dangerous, too, and this the would-be modern high school commits whose teachers cannot stand up alone in twentieth century scholarship and culture. Ideally, only the best scholar-teachers are really good enough for the high school. Only they can make it what it should be, the cultural centre of every community. Only they can really emancipate the high school, keep out pseudo-university practices, and at the same time assist the universities in the exercise of their chief function, which is not to act as an authority over anybody or anything, but to train young men and women to become their own authorities."

CHAPTER II

THE DISCIPLINARY BASIS OF COURSES OF STUDY

CHARLES HUGHES JOHNSTON

Twofold Purpose of a Course of Study.—It may have seemed to the less conservative readers of the preceding chapter that the practical considerations there adduced as genuine and urgent constitute a sufficient basis for our high school programme of studies. To the more conservative readers these considerations have doubtless seemed ineffectual substitutes for what one should regard as the permanent and respectable aims of secondary education. Either of these conclusions would be a misconstruction. The purpose of the course of study is twofold; to embody content best adapted to immediate social and economic requirements; and to select subject-matter *also* with reference to our ability to use it best *educationally*, that is, to make it over into life disciplines, into effectual habits and desirable mental traits.

Disciplinary Aspect of Education.—The other side of the case must hence receive just as careful consideration. Education would appear to lose a vital characteristic if we ignore its purely disciplinary, its traditionally honored function. This we have in great measure tended of late to ignore. The cry for high school freedom from domination, even when justified, has carried with it the tone of impatience in directing mental processes all of which

must be slowly, painstakingly, and expertly supervised if they are to be permanently worth while. Indolent and careless intellectual attitudes, superficiality and lack of thoroughness or of finished knowledge of a few fundamental subjects, inability and disinclination to think an issue or a problem through to its minute details, half-way racings into utilitarian fields, a tendency to tackle anything but the "trunk of the curricula," "novelty specifics" in which pedagogical mastery of the new material is not assured, all characterize questionable traits in high school graduates and suggest that we must regain our faith in the ultimate values and permanent results of drilled training such as some of the older disciplines and traditional models seem still uniquely to afford.

That this may not seem too severe an arraignment of much current high school work one should read the Fifth Annual Report of the Carnegie Foundation for the Advancement of Teaching, particularly the impartial and kindly but incisive critical comments of a Prussian exchange teacher and of many Oxford tutors who speak freshly from pedagogical experience with select groups of American youths. If this conviction, that we need in America a general stiffening up in methods of intellectual disciplines, be not beside the mark, it becomes the duty of high school teachers to face squarely this problem of conditions for effective discipline, physical, intellectual, and temperamental.

Modifications of the Ideal of Literal Discipline and Automatism.—Yet one may not declare too baldly this disciplinary programme for modern teachers.¹ It has

¹ For a most violent attack upon the very principle at stake here consult the tirade by Dr. Boris Sidis in his recent book, "Philistine and Genius."

dreary historic associations, implies a superimposition of unnatural tasks upon spontaneous curiosity, and reminds us of the painful and laborious literalness of memoriter performances once called "learning the lesson," or the "coming to books" of the old pedagogue days. There have been many attempts to restate the core of disciplinary education in softer and more attractive phrasing. Rousseau and even Tolstoi and Nietzsche have made the attempt. In a recent essay on the "Social Value of the College-Bred" the late William James has summed up the goal of the educative process to be that of equipping students with trained insight into and appreciation of the essentially human qualities, "the knowing of good men when we see them." Dewey would make most prominent the aim of "socializing" our students by persistently selecting subject-matter and method with reference to their value in developing these social traits. Jastrow, in his late book on "Qualities of Men," attempts inconclusively to restate educational aims and values, but hovers vaguely around some indefinite æsthetic goal. His result is unfortunately not tangible enough for actual guidance. We may condemn or praise it by calling it "suggestive." Osborn in his "Huxley and Education" is clearer. He would have us aim at developing in our students "constructive thinking," speculative ability, generalizing power, facility in solving intellectual problems and in initiating intellectual research. This is perhaps beyond our high school students. Rowe, in a book important for schoolmen, "Habit Formation and the Science of Teaching," would have us analyze exhaustively our subject-matter with reference to possibilities in it for initiating and refining specific habit processes. This treatment of the subject is well done and

from a single psychological point of view satisfactory. All of these represent plausible attacks upon the problem under discussion, differing in some points of emphasis from the purely disciplinary one upon which this chapter must focus.

Illustrations of the Need for a Thoroughgoing Reformulation of the Doctrine of Discipline.—The following extracts from brilliant but perhaps temperamentally partisan statements of our educational demand represent what part, in varying degrees of emphasis, mere individual opinion and conviction play in literary treatments of our problem. They illustrate further the urgent need that teachers work out the more fundamental question which the conflict of aims here shown seems to call for. The reader may well attempt to articulate an ideal which will harmonize or supplant those quoted herewith:

You have heard the psychologizing educator advise the formation of good, fixed, stable habits in early life. Now I want to warn you against the dangers of such unrestricted advice. Fixed adaptations, stable habits, tend to raise the thresholds of mental life, tend to inhibit the liberation, the output of reserve energy. *Avoid routine.* Do not let your pupils fall into the ruts of habits and customs. Do not let even the best of habits harden beyond the point of further possible modification.

Where there is a tendency toward formation of over-abundant mental cartilage, set your pupils to work under widely different circumstances. Confront them with a changed set of conditions. Keep them on the move. Surprise them by some apparently paradoxical relations and strange phenomena. Do not let them settle down to one definite set of actions or reactions. Remember that rigidity, like sclerosis, induration of tissue, means decay of originality, destruction of man's genius. With solidified and unvariable habits not only does the reserve energy become entirely inaccessible, but the very individuality is extinguished.

Do not make of our children a nation of philistines. Why say,

you make man in your own image? Do not make your schools machine-shops, turning out on one uniform pattern so much mediocrity per year. *Cultivate variability.* The tendency toward variability is the most precious part of a good education. Beware of the philistine with his set, stable habits.

The important principle in education is not so much *Formation* of habits as the power of their *Re-formation*. The power of breaking up habits is by far the more essential factor of a good education. It is in this power of breaking down habits that we can find the key for the unlocking of the otherwise inaccessible stores of subconscious reserve energy. The cultivation of the power of habit-disintegration is what constitutes the proper education of man's genius.—(Boris Sidis, "Philistine and Genius," 1911.)

Eleutheromania may be defined as the instinct to throw off not simply outer and artificial limitations, but all limitations whatsoever. . . . Society is plainly suffering from a lack rather than a superabundance of discipline and restraint. Many of the greatest of our modern artists, Hugo, Wagner, Ibsen, etc., have been eleutheromaniacs. For over a century the world has been fed on a steady diet of revolt. Everybody is becoming tinged with eleutheromania, taken up with his rights rather than with his duties, more and more unwilling to accept limitations. . . .

One of these results (of the drift toward a naturalistic conception of life) has been a weakening of the idea of a law for human nature as something distinct from the law for physical nature. "There are two laws, discrete, not reconciled," says Emerson—"Law for man, and law for thing." But for the pure naturalist there is only one law—the law for thing. Now any one who thus identifies man with phenomenal nature, whether scientifically or sentimentally, is almost inevitably led to value only the virtues of expansion; for, according to natural law, to grow is to expand. . . . The sentimental naturalist wishes to expand emotionally, and is averse to anything that would set a bound to emotion. The scientific naturalist would go on increasing forever in knowledge and power, and eyes askance anything that seems to fix limits to this increase.

Yet in spite of the naturalists, scientific and sentimental, we must insist not only that there is a law for man as well as a law for thing, but that the actual reason may be given why the two laws are dis-

crete and unreconciled. If man as a natural phenomenon grows by expanding, man as a man grows by concentrating. . . .

The chief use of any widening out of knowledge and sympathy must be to prepare man more fully for the supreme moment of concentration and selection, the moment when he exercises his own special faculties. Now, to select rightly a man must have right standards, and to have right standards means in practice that he must constantly set bounds to his own impulses. Man grows in the perfection proper to his own nature in almost direct ratio to his growth in restraint and self-control.—(Irving Babbitt, "The New Laocoon," 1910.)

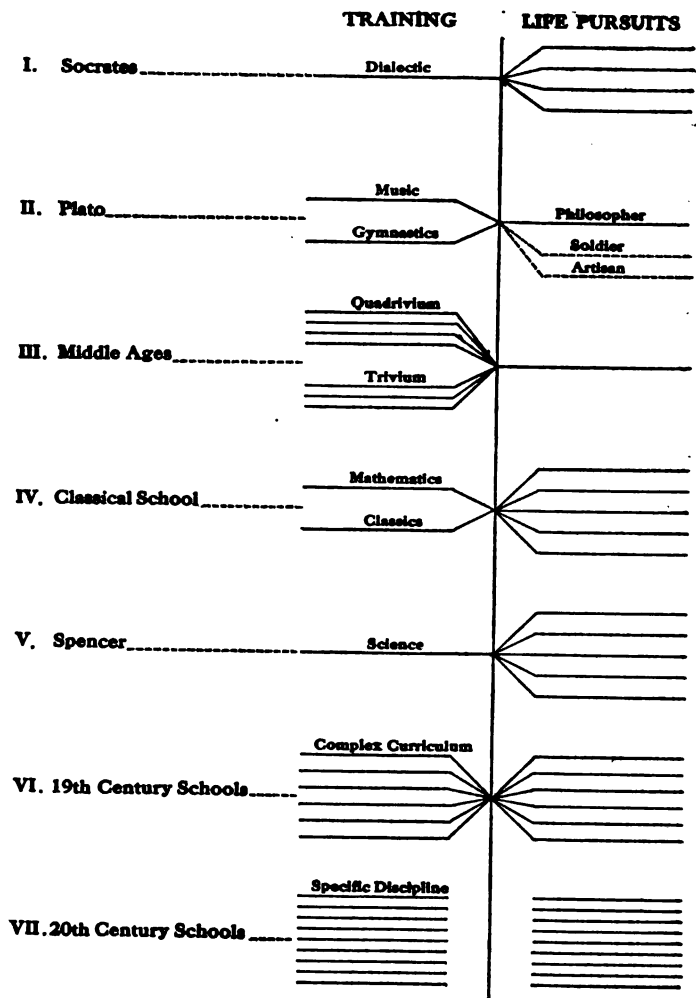
Even William James, whose treatment of "Habit" is a psychological classic, describes Thomas Davidson approvingly thus:

He avoided stated hours of work on principle. Reprehending (mildly) a certain chapter of my own on "Habit," he said that it was a fixed rule with him to form no regular habits. When he found himself in danger of settling into even a good one, he made a point of interrupting it. Habits and methods make a prisoner of a man, destroy his readiness, keep him from answering the call of the fresh moment. Individualist *à outrance*, Davidson felt that every hour was an unique entity, to whose claims one should lie open. . . . Life must be flexible. You ask for a free man, and these utopias give you an "interchangeable part" with a fixed number in a rule-bound organism. The real thing to aim at is liberation of the inner interests. Give a man possession of a soul, and he will work out his own happiness under any set of conditions.—(William James, "Memories and Studies," 1911.)

Theory of Formal Discipline.—The discussions, investigations, and experimental tests of the possibilities of transfer of training of the last two decades, known as the Formal Discipline Controversy, constitute an epoch in the history of educational theorizing. These seemed to strike at the root of all former faiths in general edu-

cation. There is little, however, in the entire outcome thus far which is reassuring. We have neither proved nor disproved the formal discipline dogma. Probably no bald theory of inevitable and definite results of specific intellectual exercises ever existed in the mind of any thoughtful educator. If we study the great formulations of educational theory by Plato, Locke, Rousseau, or Spencer, we shall find it uncritical to pin them down as adherents or opponents to a specifically stated doctrine of discipline. They qualify conditions and modify the likelihood of definite spread of effects.

The following rough diagram may help indicate how curriculum makers can, however, scarcely escape framing courses of study with reference to a partially articulate conviction as to how permanent effects of discipline, or spread of training, may be secured. The long vertical dividing line may represent the point of the student's passage from school training into life. The horizontal line or lines on the left may represent the degree of reliance upon one or more general or partially specific disciplines which may "spread" or become concentrated in later life pursuits for which the system in question provides. The more of these lines we find the less the reliance placed in any absolute theory of Formal Discipline. The lines on the right of the vertical represent the measure of conscious adaptation to those vocations and professions in the practice of which school disciplines are supposed to be essentials. The fewer of these lines the less democratic the system. The actual number of horizontal lines has no significance beyond indicating relative degrees of special provision for preparatory and distinctive mental discipline and for life. The original Socratic method, Fig. I, and by inference the



FORMAL DISCIPLINE AND COURSES OF STUDY

course of study the Greek sage had in mind, stand perhaps as our most extreme example of faith in the spread of a specific discipline. One method, dialectic, or skill in oral extraction of principle from the concrete subject in hand, and one subject-matter, topics with moral implications inherent, constitute what to us now seem to be rather meagre materials for curriculum construction. Plato's system, Fig. II, the most clearly articulated course of study in the history of education, embodies an explicit recognition of the limits of formal training. Two great types of training, the mental with a dominant speculative emphasis, and the physical, the body as a gracefully expressive medium, are distinguished. Many subtypes are allowed for. In addition to this there is recognized only one chief product, the making of the philosopher statesman. The by-products of his type of training, however, constitute our chief concern, the practical training of ordinary and moderately gifted folk who constitute the body politic of our democracy. The intellectualized and dehumanized *quadrivium* and *trivium* framework, Fig. III, or the arithmetic, geometry, astronomy, and music, and the grammar, rhetoric, and dialectic régime of barren formalism and stereotyped procedure, blind to the rich variety of social forces and functions and needs, remains still historically an important era for the student of the history of the evolution of disciplinary conceptions of education. Likewise, the old classical culture curriculum, Fig. IV, is indicative of an era in the same history of educational thought.

The necessity of distinctive disciplines and the consequent pressure of dominant professions make any unqualified faith in the value of one general discipline practically, if not theoretically, untenable in this eigh-

teenth century. The greatest, boldest, and most open attack upon traditional methods of devising courses of study—after Rousseau and Pestalozzi, who make their powerful fight for a renovation of spirit throughout the course rather than a positive reconstruction of its content—comes from Herbert Spencer. He is the champion of the scientific formulation of the purposes of the course according to well understood and commercially acceptable standards. No framer of a curriculum for secondary education should undertake his task without a thorough-going critical analysis—and, I venture to add, a rejection—of Spencerian principles. Fig. V represents, from this point of view, Spencer's underlying doctrine, his deference to the practical demands of various vocations. It likewise shows how naïvely Spencer is caught by the very fallacy he strikes at in others. He champions narrowly and consistently a one-type training, the inculcation of an impartial, depersonalized scientific attitude. Every subject in his proposed curriculum functions for the same monotonous purpose. It is merely a substitution of one extreme type of formal discipline for another, the scientific for the classical-linguistic. It is well adapted, as Royce has observed, to the production of "little Herberts." It presaged, however, later developments, and we to-day inherit, though inarticulately, and even unconsciously, many elements of this and of the other types sketched above. The next working conception represented in the diagram by Fig. VI is a blind and in great measure unsatisfactory compromise. Specific disciplines, a qualified acceptance of likely but limited transfer of training, characterize the points of view of the leaders in secondary education of the generation just past. The last illustration, if we add indefinitely to the lines drawn on

either side in Fig. VII, may indicate the absurd extreme to which we may be led if we discard disciplinary conceptions altogether and seek to furnish literal training for the merely mechanical processes called for in the various life pursuits.

Transference of Skill.—In a general discussion of this character one cannot fairly raise all the intricate and problematic psychological issues involved in the question of how one kind of skill or facility acquired in a particular branch of study, Latin for example, may later in life become transformed into expertness and more generalized control of faculties in a different kind of activity and in a different environment. One must go now fortunately to the sources. The mere fact that the validity of the dogma of discipline was seriously denied has put the whole question of the theoretical and scientific bases of the curriculum upon an experimental footing. Adherents and opponents of the doctrine have been forced to resort to demonstrations, to conduct extended investigations, and to plan for experimental tests under reliable control conditions. The issue has cleared away obstructions and put a premium upon clearly articulate ideals. Already we mark the inevitable passing of a strictly faculty psychology—the pseudo-scientific support of the ancient doctrine. The burden of proof is now placed upon those who can ascribe no specific disciplines to their courses. From this theoretical commotion has come better reasons for the incorporation of even mathematics or the classics in our courses. It has ushered in an era of healthy school-room experimentation. Psychological insight into the complex elements involved in the simplest acts of memory, or attention, or learning, or habit forming and habit breaking, has revealed, for

the better professionally trained high school teacher, the unreliability of a traditionally final and mysterious attitude toward the educative process. In the tentative conclusions thus far reached as the results of experiment it seems to have been established that there are degrees of inevitable loss in transfer, and that conditions for these degrees of transfer may be defined with some assurance. There has also come about naturally in this way the recognition that a teacher must define with more analytic insight just what traits or habits or attitudes he may safely seek to inculcate through the instrumentality of the distinctive subject-matter of his course.¹ We may safely predict that the upshot of this educational ferment as to disciplinary values of particular subjects will be the appearance shortly of treatises dealing with the psychologically distinctive values of all seriously proposed subjects for the high school course. The following chapters of this book represent an attempt to meet this anticipated demand.

The chief urgency that schoolmen ground themselves in the incipient stages of this controversy is, not only that they may gain assurance as to the ultimate theoretical position to take, but that they may share constructively in the work of recording relevant observations and demonstrated results, and that they may in this way add their influence and moral support to the effort to establish secondary teaching on a dignified and scientific professional basis.

Experiments in Transfer of Skill.—The experimental investigations thus far have been in the main severely technical and under conditions only remotely analogous to those of the school-room. Thorndike's and Woodworth's earlier work and even the pioneer tests for spread

¹ For a good discussion of the amplifications of this statement the reader may consult S. S. Colvin's "The Learning Process," 1911.

of memory effects of Ebbinghaus and of James, the tests devised by Scripture and Davis, and the learning curves of Bryan and Harter, Swift, Book, Ruger, and others where transfer is in question—all seem to have dealt with more or less mechanical and literal acquisitions of skill. Where little or no transfer or even loss of transfer of skill acquired in the specified training resulted, we have tests under conditions which are neither natural nor desirable in school work. The investigations of Meumann and even more the recent work of Winch, although their results are meagre and questionable, seem to indicate that the tendency now is to make the school-room an educational laboratory.¹ This is *par excellence*, then, the school-man's scientific problem: How demonstrate the best conditions for the transference into permanent personal attitudes of the specific habits we, through our chosen subject-matter, may bring about?

The first step for the teacher will be to enumerate and tabulate, exhaustively and discriminatingly, two lists of actual or possible student habits; first, those we seek to eradicate; and second, those we may reasonably seek to inculcate by a systematic, scientific, and artful method, planned to extend over periods of months, and not merely to be started by broken recitation doses. Habits in the broad sense of attitudes of mind, methods of study, sanity and prudence of judgment, accuracy of statement, and nicety of discrimination must be idealized and specifically practiced under skilful teacher guidance. The laws of learning, the technique and complexity and personal intimacy and pervasiveness of practically all habits,

¹ Colvin reports, in the book already referred to, that he has instituted tests of various sorts under school-room conditions, and that his results are to be published.

constitute a superb challenge to the teacher. These and myriads of similar problems are all wrapped up in this inevitable question of how we may more intelligently subject all our ideals and technical devices to constant scrutiny, and how patiently we must persevere in our attempts to choose the meatiest content at command and transform it through our unescapable disciplinary function into student acquisitions which will bear the test of time and take definite form in the crucible of democratic citizenship ordeals. Of how this may be done specifically through the subject-matter the schoolman has to select from, the chapters to follow attempt to indicate.

Vital Questions for the Teacher.—Finally, it should be kept constantly in mind that, in the considerations of this chapter, two vital questions are involved. One is that we must make our choice of studies and of selected materials in these studies with reference to the *disciplinary effects* inherent in them, as well as with reference to the immediate social use and advantage they possess. The other is that, after our curriculum subjects and the particular topics within these special fields have been settled upon, *we must refine our methods so as to make the best possible use of the subject-matter in the course.* This latter point applies particularly to the average teacher who unfortunately at present has little to say in the choices of curriculum subjects. Maximum results and permanent benefits become the goal. From the point of view of this second question also, not only the classical studies, but agriculture or domestic science, or even music, must be measured finally in terms of a broadly conceived disciplinary standard.

For reading references for this chapter and later chapters, see bibliography at the end of the book.

CHAPTER III

HISTORY OF SECONDARY CURRICULUMS SINCE THE RENAISSANCE

G. L. JACKSON, PH.D.

ASSISTANT PROFESSOR OF THE HISTORY OF EDUCATION,
UNIVERSITY OF MICHIGAN

Aim of Chapter.—The aim of this chapter is briefly to show the various factors which have shaped the curriculum of the secondary school from the Renaissance to the present time, to account for the new types of secondary schools which from time to time have sprung into being, to point out the traditional factors in the present course of study, and, having set forth the origin, aim, and conditions which gave them a place in the secondary programme, to give a basis for judging the rationality of the present curriculum with respect to its power to serve present needs. This survey can touch but lightly the most important educational epochs, and statements must be made more or less dogmatically which would be qualified in some respects in a more detailed study.

Greek Education.—As the Renaissance was a revival of the liberal education of the Greeks and the Romans and was a reaction against the education and the ideals of the Middle Ages, it is necessary to set forth the larger aims of these educational systems. The education of the Greeks was aristocratic, that is, on account of the cost it was possible only to the few; its aim was to de-

velop the individual for the noble enjoyment of leisure and to fit him for leadership especially in the field of politics. To the Athenian the field of action and the field of speculation were not restricted; he might follow the argument wherever it chanced to lead, exercise his mental powers in any way that pleased his fancy, and with what results we are all familiar. The education which prepared for these mature activities the Greeks called the liberal education. It was informally organized into elementary, secondary, and higher in the latter part of the fourth century. As a rule the following subjects stood between the work of the elementary school and the higher branches as given in the rhetorical and philosophical schools—grammar (including composition, history, and literature), arithmetic, astronomy, geography, geometry, music, and gymnastics. The greatest amount of time was put upon the study of grammar.

Roman Education.—The Romans were greatly influenced by Greek methods, subject-matter, and organization, and, according to the usual Roman practice of taking for their own use whatever seemed to their advantage in the development of the imperial idea, they adopted the liberal education of the Greeks but modified it to the characteristic practical bent of the Roman genius. Roman education, like the Greek, was for the few and was concerned ideally with the development of the orator. Quintilian, who represents in his *Institutes* the best type of Roman education, makes grammar (used in the Greek sense), geometry, astronomy, and music the subjects of the secondary curriculum. Grammar is the secondary subject to which the Romans gave the greatest amount of attention. By the middle of the fourth century A. D., Roman education had crystallized

into the study of those subjects which were later known as the seven liberal arts—grammar, rhetoric, dialectic, arithmetic, astronomy, geometry, and music. The first three,—or the trivium, as they were called—were propædæutic to the mathematical subjects or the quadrivium.

Mediæval Education.—Without entering into a discussion of the attitude of Christianity toward pagan learning, we may make the bald statement that with the downfall of pagan worship the seven liberal arts were looked upon by the Christians with less disfavor than when these arts were ministering to the needs of their opponents. Through the influence of St. Augustine, Cassiodorus, and the Rules of Saint Benedict the Egyptians were despoiled, and pagan learning, greatly modified by its new aim, became a part of the training for leadership in the spiritual life of the time. The following is an ideal mediæval course of study outlined by William, Abbot of Hirschau (1069–1091):

The course, however, is that because all teaching is done by word of mouth, we are to be instructed in speaking first. This instruction is divided into three parts: to write and speak correctly as prescribed by grammar; to prove what has to be proved in conformity with logic, and to ornate the same, as taught by rhetoric. Thus fitted out and provided with these arms, we must begin the study of philosophy, in which the order is, first, the quadrivium, and then the Holy Scriptures, arriving, through knowledge of that which is created, to the knowledge of the Creator.

The ideal monastic curriculum is seen to have contained the subjects named by the Greeks as fundamental to the liberal education, also those by which the Roman aimed to produce the orator. The church used them as a means of spiritual growth; the aim is purely ecclesiasti-

cal. Naturally, this type of education did not appeal to the laymen. It was not until feudalism connected itself with religion and religious wars that the secular nobility had what might be termed a system of education, that is, the discipline of chivalry. It contained but little of what might be termed book-learning.

The Renaissance.—Space forbids any discussion of the causes which brought about the Renaissance. It must suffice to say that the movement begins in the thirteenth century as a reaction against the spirit of authority and constraint which marks the mediæval period in practically all avenues of expression. The great interest in classical literature is a later phase of the general movement; the desire for liberty and freedom came first. When men imbued with this spirit read the classics, they found there depicted men who had enjoyed the all-round intellectual, æsthetic, and physical development which they as reactionaries craved. Thus the classics came to be valued for their content rather than as material for the illustration of grammatical rules which was the use to which they were usually put in mediæval education. But in addition to the content the men of the Renaissance recognized the beauty and the value of classic style or expression. They recognized the fact that but for the form in which the content was expressed the works would not have lived. However, in the early Renaissance the form was secondary to the content.

The broad conception of life peculiar to the Renaissance, a life which to a certain extent could be realized through a study of books, offered a basis for the fusion of the ideals of the knight or courtier, as he was now called, and the ideals of the learned class. This is no unimportant matter in the history of civilization. This fusion

of ideals is brought out clearly by Castiglione (1478-1529) in his "Courtier."

But besyde goodnesse, the true & principall ornament of the mynde in everye manne (I beleave) are letters although the Frenchmenne know onelye the noblenesse of armes, and passe for nothing besides; so that they do not onelye not sett by letters, but they rather abhorre them & they think it a great vilany whan any one of them is called a clarke.

The greatest educational effects of the Renaissance were in the field of secondary education, and the school which best typifies the ideals of the early period—the development of mind, soul, and body—was that of Vittorino da Feltre at Mantua. His curriculum and method were based on the *Institutes* of Quintilian; the style and spirit of literary composition on the study of Cicero.

The Sixteenth Century.—But the broad conception of the aim of education and the treatment of subject-matter as a means to compass this desired end, had suffered by the sixteenth century a decided change. This was due to admiration of the style of Cicero irrespective of content, and to teachers who could drill vocabularies and the rules of grammar and rhetoric into their pupils with greater ease than they could form character. This change was reinforced later by the Reformation and counter-Reformation whose immediate influence was to make education narrow, scholastic, and theological. The nobility became estranged from this type of education; scholars were again looked upon by the gentle class with contempt; and a knowledge of the world and of people was considered to be the desirable education for the gentleman.

No better illustration of the organized secondary education of the period, both from the point of view of its influence and its course of study, can be found than that of Sturm's Gymnasium at Strasburg, founded in 1538. The subjects of this curriculum formed the backbone of secondary education in Europe and America to the middle of the nineteenth century, though, of course, the schools of the smaller towns and villages could not give so extensive a training as is described. The boy entered this secondary school at the age of six and immediately began the study of the following curriculum in which the dominance of Cicero is shown by italics:

Reading and writing. Catechism. Latin grammar. *Letters of Cicero.*

Latin grammar. Eclogues of Vergil. *Letters of Cicero.* Conversation in Latin. Religious instruction.

Latin grammar. *De Amicitia and De Senectute.* Selections from Vergil, Catullus, Tibullus, and Horace. *Latin composition* (prose and verse). Religious training.

De Oratore. Poetic selections from 'authors named above. Caesar's Commentaries. *Latin composition.* Religious instruction.

Greek begun. *De Officiis.* Georgics. *Pro Lege Manila.* *Latin prose* based on *De Oratore.* Religious training.

Cicero and Demosthenes; Vergil and Homer. *Rhetoric.* Sallust and Plautus. Religious teaching.

Dialectic. *Rhetoric.* Greek orations. Sallust, Cæsar. Livy. Religious teaching.

Dialectic. Dialogues of Plato and *Cicero.* *De Oratore.* Hebrew. Religious teaching.

Declamation. Aristotle. Arithmetic. Astrology. Demosthenes and Homer. *Oratory.* Hebrew. Religious teaching.

Predominance of Latin.—As this is the typical curriculum of the best secondary schools during the sixteenth century in Germany, France, and England, let us examine it somewhat more closely. We find but slight attention given to mathematical science—although arithmetic appears in Sturm's curriculum, no time was found for nearly fifty years in which to teach it; natural science is given no place, neither is geography, though ancient geography was doubtless touched upon in the classical studies by some teachers; physical training was not given; no attention was paid to the vernacular; no training of an æsthetic nature except in appreciation of literary form is to be found. But little, it is evident, is left of the Renaissance conception of the aim of education. The ready command of the Latin language was the main object of secondary school work and it must be noted with respect to this aim that Latin was still the language of scholars, of scholarly books, and formed with Greek and Hebrew the necessary tool for investigating religious sources. But the classics were no longer studied for their content value. The emphasis, as has been remarked, was placed upon the practical command of the language through grammar, rhetoric, and composition—the liberal education of Plato, of Quintilian, of Vittorino, has become confused with drill, memory work, and slavish imitation. The social force of this curriculum of the sixteenth century lies in the fact that it emphasizes and supports the religious spirit of the time. The Reformation and counter-Reformation schools rescued ecclesiastical training from what might be termed the worldliness of the Renaissance.

The Seventeenth Century.—The secondary schools of the early seventeenth century were as follows: In Ger-

many, after 1543, they were of two types with respect to control and support: (1) the city schools; *e. g.*, Strasbourg, which had their roots in the mediæval period and were controlled and maintained by the municipalities; (2) the state schools beginning at the above date and founded under Reformation influences, particularly Luther's, administered and supported by the state. Gradually the state has extended its sphere of educational influence until the State Gymnasien form at the present time, as Paulsen puts it, the backbone of the German educational system. Tuition charges were assessed; in fact, to-day the United States and Canada are the only countries which have an absolutely free system of secondary schools.

In England there were the (1) English public schools, *e. g.*, Eton, Harrow, etc., and (2) the Latin grammar schools. Neither of these types of schools was under government supervision. With respect to support and control these schools were either upon foundations (endowed); proprietary *i. e.*, founded and governed by a commercial corporation; and private. The endowed schools in particular provided for the free education of a certain number of boys who were usually called "foundationers"; all others in all schools paid fixed fees.

In France the most satisfactory secondary education was to be had in the Colléges of the Jesuits. It is agreed on all sides that the Jesuit teachers and the Jesuit schools were the best which Europe afforded from the late sixteenth to the middle of the eighteenth century. Tuition was free.

The Latin grammar schools of the American colonies in their general aim and curriculum were like their prototypes in the mother country. In the agreement be-

tween the town of Dorchester and the teacher for the year 1655 appears the following:

. . . to teach in a free Schoole in Dorchester all such Cheldren as by the inhabitants shall be Comitted vnto his Care in Ennglish Laten and Greeke as from time to time the Cheldren shall be Capable and allso instruct them in Writinge as he shall be able: which is to be vnderstood such Cheldren who are so far entred all redie to knowe there Leters and to spell somewhat . . .

Massachusetts in 1647 and Connecticut in 1650 made the type of school mentioned above compulsory by the following enactment:

It is further ordered, That where any town shall increase to the number of one hundred families or householders, they shall set up a grammar school, the master thereof being able to instruct youth, so far as they may be fitted, for the university . . .

To recapitulate: We find that in the early seventeenth century the study of Latin primarily and Greek secondarily constitutes the main work offered in the secondary schools of Europe and the length of time for which this statement continues to hold true has been suggested; that, by centuries of teaching, the method of instruction in the Latin language was wellnigh perfected and the subject-matter satisfactorily selected; that the results of Latin teaching of that time, from the point of view of knowing Latin, were far better than at present; that the secondary school prepares for the university; that elementary education consists in the bare ability to read and to write. As a result of this purely linguistic type of education we find that the secondary school acts as an extremely narrow selective agency. Only such as are naturally gifted

for language work are able to survive and achieve any success in this linguistic discipline. To others, organized education offers no opportunity for the development of those powers or interests not demanded by the Latin grammar school. With respect to method of teaching we find that subject-matter is arranged and presented from that point of view which appeals to the adult. We now have a part of our present day curriculum firmly established—the remainder of the chapter will concern itself with those transition features which brought about new types of schools and secured a place for other fields of experience alongside the traditional subjects.

Reaction from the Reformation.—The vital, liberalizing force of the Reformation soon came to an end. Religion became formal and consisted for the most part of intellectual assent to a skilfully drawn creed. Reaction came through two channels: first, the development of scientific interests which since the early Renaissance had led an extremely attenuated existence, and, second, the rise of a new religious spirit which placed the emphasis upon faith and conduct. Bacon (1561-1626), Hobbes (1588-1679), and Descartes (1596-1650) were the leaders of those reactionary forces opposed to the dominant intellectual life of the times. They stand in particular for that movement which developed the mathematical sciences and applied them to the solution of the problems of natural science and, in general, for the use of reason in all activities. This transition period marks the rise of modern philosophy and science, and, on the political side, the rise of the modern state. The movements toward religious reform are known in England as Puritanism, in Germany as Pietism, and in

France as Jansenism; the leading educational exponents were Milton, Francke, and Saint-Cyran.

This movement was highly influential in the field of secondary education. It placed the emphasis upon the utilitarian, upon the "real" subjects—mathematics, modern language (especially French), physics, political and social science, geography, modern history, etc. The value of ancient science and language was violently attacked, though Latin was still considered a necessary part of a gentleman's training. During the last half of the seventeenth and all of the eighteenth century it was Descartes and Locke, Leibnitz and Kant who directed the trend of thought, rather than the great theologians.

Practical Result of Reaction.—On the side of organization this movement resulted in the establishment of three types of schools—the *Ritter-Akademien* or schools for the sons of the German nobility; the school of Francke at Halle which attempted to unite the realistic and practical subjects with the traditional curriculum and whose influence is directly responsible for the present *Real-Schulen* of Germany; and the academies. Probably the best known example of the early American academy is the school founded in 1751 through the influence of Benjamin Franklin—"The Academy and Charitable School of Pennsylvania." Provision was made in this academy for the differentiation of the curriculum into three courses—Latin, English, and mathematics. Franklin did not consider the study of ancient languages necessary for the majority of boys, and, though he planned for the traditional course of study, his main interest was in the English course or school. After the usual elementary preparation of the time, *i. e.*,

reading and writing, the boy pursued the following subjects:

Reading the best English authors, spelling, English grammar, rhetoric, declamation, ancient and modern history, natural philosophy, English composition, moral philosophy, geography, logic.

With respect to the English course he adds:

The hours of each day are to be divided and disposed in such a manner as that some classes may be with the writing master, improving their hands; others with the mathematical master, learning arithmetic, accounts, geography, the use of globes, drawing, mechanics, etc.; while the rest are in the English school, under the English master's care.

The Classics.—Since the churches in those countries affected by the Reformation did not use Latin, and since French had superseded Latin as the language of court and diplomacy, the social value of the classics, which has been previously mentioned, was largely gone. For *teaching purposes*, however, the classics still presented a definite body of subject-matter and a well-tested method of instruction;—this could not be said of the sciences at this stage of their development. The classics also had the school traditions of centuries behind them. In order to resist the efforts of the rationalistic-scientific movement to dislodge them from the curriculum, the study of the classics was urged not upon *social but upon psychological grounds*.¹ It was held that the value of education depends not so much on what is learned as on the process of learning. This psychological basis, reinforced by the rationalistic spirit of the age, also accounts

¹ Cf. chapter II.

for the addition of mathematics to the traditional linguistic curriculum. According to Locke:

Would you have a man reason well, you must use him to it sometimes, exercise his mind in observing the connection of ideas and following them in train. Nothing does this better than mathematics, which therefore should be taught all those who have the time and opportunity, not so much to make them mathematicians as to make them reasonable creatures.

On the above grounds the schools mentioned as giving secondary education at the close of the sixteenth century still flourished at the close of the eighteenth century, with curriculum but slightly modified through the introduction of a small amount of mathematics. Exception is to be made, however, in the case of the French Collège. The Jesuits were expelled from France in 1762 and the Colléges of the University of Paris were abolished in 1793 by act of the Convention. The close of the eighteenth century, then, finds secondary education in France in a chaotic state.

Influence of Rousseau.—The general effects of the influence of Rousseau upon secondary education is primarily to be found in the spirit of the work given in the secondary schools already in existence. One aspect of his theories united readily with the Neo-Humanistic movement which stressed (1) the idea of free natural development to be secured through a study of Greek authors, and (2) the cultural value of historical study—this affected the *Gymnasien*. Another aspect of his social and educational theories reinforced the principles fundamental to the existence of the *Real-Schulen* and the Academies, in so far as they dealt with the realities of nature and sought to impart a knowledge of the principles underlying commercial and trade practices. His

whole theory was a blow aimed at class privilege and it gave additional impulse to the upward movement of the middle-class and its importance in the sphere of politics. This leads directly to the breaking down of those barriers which had confined secondary education to the few. Education was now looked upon as a *civil rather than as an ecclesiastical matter*; as related to the state rather than to the church. Education was one of the matters to which the French Conventions gave the greatest attention; but little, however, was actually accomplished. The educational implication of Fichte's appeal to the German nation was national and civic rather than ecclesiastical. The extension of suffrage in England, beginning in 1830, was immediately followed by legislative enactment aiming to increase opportunity for education. Our Ordinance of 1787 contains the following clause: "religion, morals, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged"; the speeches of Governor Clinton, of New York, constantly ring the changes on the value of education for good citizenship; in the legislative debates on the question of establishing free schools, the argument is always advanced that education is the bulwark of the poor man's political rights.

German Secondary Education.—The general trend of development in the field of German secondary education from the beginning of the nineteenth century to the present time has been along the line of recognizing the utility of types of schools which give opportunity for special training. These are the classical or *Gymnasien*, the semi-classical or *Real-Gymnasien*, and the modern or *Ober-Realschulen*.

The following table indicates the subjects pursued and the hours devoted to each. By hours is meant the number of recitations per week for nine years (the time required to complete the full secondary course); as, for example, natural science twice a week for nine years would be credited with eighteen hours.

	GYM.	REAL-GYM.	OBER R. S.
Religion.....	19	19	19
German and history.....	26	28	34
Latin.....	68	49	..
Greek.....	36	..	..
French.....	20	29	47
English.....	..	18	25
History.....	17	17	18
Geography.....	9	11	14
Mathematics.....	34	42	47
Natural science.....	18	29	36
Writing.....	4	4	6
Drawing.....	8	16	16
Total hours in course.....	259	262	262

About one-third of the current expenses of these schools is met by tuition fees.

English Secondary Education.—Secondary education in England during the first half of the nineteenth century was at a low ebb. The schools had been but slightly affected, if at all, by the modern demands for science, mathematics, modern languages, and history, but in response to public sentiment aroused by the reports of the parliamentary commissions appointed in 1861 and 1864, the secondary schools now have what is called a "modern side." This is shown by the following course of study of Haileybury, a public school:

	CLASSICAL SIDE 6 YEARS HOURS	MODERN SIDE 3 YEARS HOURS
Divinity.....	15	8
Latin.....	44	17
Greek.....	33	..
English.....	7	2
Modern languages.....	10	22
History.....	10	5
Mathematics.....	31	27
Natural science.....	..	5
Geography.....	4	5

At the present time secondary education is given in the great public schools which are patronized by the upper class; grammar schools controlled by local civil authorities or by boards representing the donors; private schools, as a rule owned by the head-master; and local board schools, created by recent parliamentary acts and supported by local rates and state aid.

French Secondary Education.—The present secondary school system of France has its origin in the law of May 1, 1802, which established the communal *collèges* and the *lycées*. The main distinction between these schools is in the matter of support; the expenses of the latter are entirely the concern of the state, while part of the expenses of the former are met by the commune. As in Germany, the general trend of development has been along the line of giving training through special courses for various fields of activity, though, as in England and in America, the attempt to solve the problem is by giving a choice within the one school rather than differentiating types of schools. The present course of study is divided into two cycles, one of four years and the other of three.

In the first cycle two courses are open for election; in the first two years of the second cycle three are open, but choice will depend upon what preparation was received in the first four years; two are open in the last year, choice again depending upon previous preparation. The following is the table of hours for the seven years' work:

	FIRST CYCLE, 4 YEARS		SECOND CYCLE, FIRST 2 YEARS			
	(A)	(B)	(A)	(B)	(C)	(D)
French.....	12	19	6	6	8	8
Latin.....	26	..	9	7-9	..	..
Greek (opt.).....	8	..	10	..	..	..
Modern languages.....	20	20	4	14	4	14
Mathematics.....	7-9	15	2	2	8	8
Science.....	3	9	3	3	13	13
History and geography.....	12	12	10	10	6	6
Ethics.....	2	2	..	..	..	..
Drawing.....	8	6-10	2-4	2-4	5	5
Writing.....	..	2	..	..	..	..
Book-keeping.....	..	2	..	..	..	..
Elements of law.....	..	1	..	..	..	..

In Second Cycle (A) is equivalent to Classical, (B) to Latin and Modern Languages, (C) to Latin-Scientific, (D) to Science and Modern Languages.

	SECOND CYCLE, THIRD YEAR	
	PHILOSOPHY	MATHEMATICS
Philosophy.....	8-9	3
Greek.....	2 (opt.)	..
Latin.....	2 (opt.)	..
Modern languages.....	2 (opt.)	2
History.....	3	3
Mathematics.....	2	8
Science.....	5	9
Drawing.....	2 (opt.)	2 (opt.)
Hygiene.....	12 lectures	12 lectures

Early American Schools: The Academy.—The beginnings of a new movement in education in the American colonies has been indicated in the discussion of Franklin's academy. That the Latin grammar schools were but slightly, if at all, affected by this movement is shown by the fact that college entrance requirements were not changed until the year 1807. Harvard at this time added geography to the time-honored requirements in Latin, Greek, and arithmetic. It was the Revolution, the emphasis upon the rights and equality of man, the growth of a middle-class, the idea that education had value in itself for citizenship and a wide-spread desire to secure it, the demand for a more practical training along the lines of mathematics and science, and a patriotic demand for a greater emphasis upon the study of English, rhetoric, and public speaking that formed the basis for a new type of school—the academy of the nineteenth century. It will be readily seen that neither the restricted curriculum of the Latin schools nor the narrow instruction of the college satisfied the demands of these new political and social conditions. The academy, on the other hand, offered a wide range of subjects—many of them poorly organized and poorly taught to be sure—and sought to give something like a well-rounded education to the many for a small tuition charge. From its preparatory nature the Latin school could not do this, and the college either did not appeal to or was too expensive for the many.

In the first part of the century the course of study in the academies was rather an indefinite quantity. Continuity and grading of work was possible, of course, in the classics and in mathematics; but as a rule classes were formed in various subjects according to the demand.

In time courses of study of from three to five years were formed. Usually these comprised the college preparatory course which in most academies became the standard, the English course, the scientific course, and later the Latin-scientific course. For purpose of comparison, the curriculum of one of the best New York academies, that at Albany, and the curriculum of the Boston Latin School, both in the 50's, are given below.

Albany: Arithmetic, algebra, architecture, astronomy, botany, book-keeping, chemistry, composition, conic sections, constitution of New York, declamation, drawing, English grammar, French, geography, physical geography, plane and analytic geometry, Greek, general history, U. S. history, hydrostatics, Latin, logic, mechanics, mineralogy, navigation, optics, orthography, natural philosophy, moral philosophy, penmanship, political economy, reading, rhetoric, Roman antiquities, surveying, trigonometry, technology.

Boston: "The rudiments of the Latin and Greek languages are taught, and scholars are fitted for the most respectable colleges. Instruction is also given in mathematics, geography, history, declamation, English grammar, composition, and in the French language." Quoted from the regulations of the school committee.

The High School.—The academy, however, was not in the control of the people, was not accessible to the many, charged tuition fees, and took the boy or girl away from home in many cases, which necessarily added to the expense. Consequently we find in some of the larger cities that a type of school arises which is controlled and supported by the citizens and organically connected with the elementary schools. This is the beginning of our present high schools. The aim of the early high school did not differ from that of the academy. It did not concern itself with preparation for college but looked toward

giving a free, practical, and cultural education to the children of the municipality. The first school of this type was the English High School of Boston, founded in 1821. It represents a reaction against the exclusively classical education of the Boston Latin School.

In 1825 a high school for boys was opened in New York City. A part of the report on this school reads as follows:

It should never be forgotten that the grand object of this institution is to prepare boys for such advancement, and such pursuits in life, as they are destined to after leaving it.

Free High Schools.—The high schools did not increase in numbers very rapidly until free school systems were adopted in the various States. Additional impetus was given to the movement by a decision, handed down in 1872 by Judge Cooley, of Michigan, in the famous “*Kalamazoo Case*,” to the effect that taxes may be raised for the support of any grade of instruction provided the majority of voters so elect. With the growth of the high school supported by public taxation the academy, dependent upon tuition charges, has been forced to give way.

The Course of Study.—Like the academy, the high school in its early history offered a generous number of subjects with little or no restriction upon what should be taken. The results were not satisfactory and the next step was to form definite courses, one of which the pupil must choose to follow without deviation. This, too, proved unsatisfactory, for it led to too early specialization. This has given rise to the various methods of dealing with the course of study familiar to all of us, *i. e.*, free elections, free elections within certain required groups, required subjects supplemented by electives, etc.

The High School and the College.—The whole situation has become complicated by the fact that in the course of time the high schools have entered into organic relation with the higher institutions of learning. Probably the most important factor in this partial change in aim was the establishment of the State systems of education extending from the elementary school to the university. Naturally the demands upon the high schools of the State for college preparatory work were legitimate, and naturally the university authorities have been mainly interested in the secondary school and its work on the preparatory side. Though it has never been admitted that the function of the high school is not primarily to fit boys and girls for life-work and to give them some conception of culture, yet college entrance requirements have the advantage of offering a definite teaching aim and a definite standard for evaluating the work of the school that is here and now—the teacher knows exactly what is demanded. But the teacher is not so certain of what preparation for life really is, particularly life in a democratic society, and the results are checked up with the greatest difficulty.

Different Types of High Schools.—The various differentiations within the school system as seen in the establishment of commercial high schools, technical high schools, manual training high schools, English high schools, classical high schools, and the variations within the general course of study of the standard high schools which seek, as far as possible, to offer an equivalent of the special types just mentioned, are the results at the present time of the attempts to secure a working solution of the two demands upon the secondary schools: What may the universities properly require of the “people’s

colleges" in the way of entrance requirements, and how shall the secondary school prepare individuals for the practical work of life and at the same time give that insight and form those habits which shall enable them to employ their leisure to the best advantage for self and society?

CHAPTER IV

PRINCIPLES AND PLANS FOR REORGANIZING SECONDARY EDUCATION

CALVIN OLIN DAVIS, PH.D.

ASSISTANT PROFESSOR OF EDUCATION, UNIVERSITY OF MICHIGAN

Necessity for Reorganizing School System.—The present plan of organizing public secondary education in the United States is irrational and wasteful. It can find no real basis in history, psychology, or logic. Neither does it have the support of contemporary practice in other enlightened countries. In its form and administration it stands alone, but it is unique in ways which are open to severe criticism. There is a growing and insistent demand that conditions be changed, that our entire public school system be reorganized in the interest of economy of time and administration, adaptability to individual needs, training for specific personal aims, and extension of social welfare.

If one looks to history for an explanation of the present system, one is forced to turn away unsatisfied. Historically, even in America, secondary education has never till recently meant four years of school work superimposed upon a required elementary course of eight or nine years. Nor has admission to the secondary school ever till recently presupposed a greater knowledge than a reasonable familiarity with the school arts. The

records of the colonial Latin grammar schools and of the old academies show this. It was not till well down in the nineteenth century that any noticeable departure from this custom was made. In 1821, when the first high school in America was established, the sole terms of admission were ability to pass examinations in reading, writing, arithmetic, and English grammar.

Lengthening of Elementary School Course.—With the rise of the later academies and the differentiation of the English course in the high school from the classical course the period of pre-secondary education was prolonged. Colleges increased their requirements for admission. Secondary schools, following the suggestion, became more exacting with the elementary schools. But the elementary school as then organized was unable to meet the demands. The elementary school year was short; the elementary school-teacher was poorly trained; pedagogical methods were inferior. Hence annual progress was slow. Thus it was that two, four, six additional years were added to training in these school arts. For a period there was little uniformity, but finally the course eventuated in the present elementary regime of eight or nine years.

Foreign Schools.—If one turns to European countries for suggestions there is little encouragement. Current practices there lend no support to the policy of postponing entrance upon secondary school work until the completion of eight or nine years' elementary study, or until the youth has attained the age of fourteen or fifteen years. Neither do the school systems of foreign countries limit the typical course of secondary instruction to four years. Germany, France, and England have, almost from the very outset, provided secondary schools

that have been organized on the basis of six, seven, eight, or nine year courses. Recently Japan has reorganized her school system upon this principle. In none of these countries is a youth required or expected to complete an eight or nine year elementary course before being admitted to the secondary school. In none of them does an undifferentiated elementary course extend beyond a period of six years, and usually a student enters upon the work of the secondary schools at the age of nine or ten years.

American Educational Work Wrongly Organized.—Again, the present mode of organizing and administering educational work in America is psychologically ill-grounded. The adolescent period begins usually at about the age of twelve years. With the dawn of this new period come most notable changes in physical form, structure, and function and most decided concomitant psychological changes. At this period self-consciousness is born. The interests that formerly held dominant sway are cast aside. New motives stir, new aspirations fire, new goals beckon. Conscious logical reason begins to proclaim itself. The mind is no longer satisfied with mere empirical facts, but it demands that the facts be presented in their essential relations. There is also a restlessness and a desire for movement. Individuality begins its play and demands a larger circle in which to assert and express itself. Implicit obedience and conformity to laws and rules arbitrarily imposed can no longer be secured. The purpose and necessity for restraint must be made clear and intelligible; if not, tacit or open rebellion ensues. The youth's whole nature calls out for room—more room.

. To enforce unnatural restraints upon an adolescent is

to deaden his sensibilities, stifle his intellectual and his social enthusiasm, and atrophy his powers. To keep him under the restrictive and arbitrary discipline of the ordinary elementary school is to sin against nature and to commit an offence against the laws of social well-being. To employ with him the methods of instruction and training of the elementary schools is to provoke him to truancy, encourage him to evade school work, and impel him to forsake school duties altogether. The beginning of adolescence is most emphatically the beginning of the period of secondary education. As our schools are organized and administered to-day this fact is ignored.

Thirdly, there is no reasonable basis for organizing our school work as it is. Reason would assert—historical and psychological considerations aside—that the schools should be so organized and administered as to meet the needs of the greatest numbers of persons for whom they are nominally designed. Instead of preparing each pupil as fully as possible for the position in society for which his aptitudes, interests, and resources make him most fit, our system forces or permits a deplorable number to leave school and become, for the most part, either discontented misfits or else hardened, unaspiring, inefficient citizens. Here is a sheer loss of an astoundingly large per cent of the raw material during the process of production. Any private manufacturing industry that should, because of operating methods, lose or cast aside from its unfinished product one-tenth of what is lost through the maladministration of our school system would be forced into voluntary or involuntary bankruptcy in an incredibly short time—and it ought to be so.

No school system, any more than any machine, can be operated without some loss. Nevertheless it is possible greatly to minimize the losses incident to the administration of a system irrationally organized. An organization that needlessly and knowingly duplicates efforts; that continues to emphasize much that is non-essential to life's interests and impracticable for boys and girls at the time the subject is presented to them; that neglects to afford opportunity for the discovery of real individual aptitudes or to stimulate and develop them when revealed; that permits dangerous gaps and openings to exist between the sections of its course; that allows no individual to be ranked or classified any higher than the standard made in respect to his smallest and most insignificant talent; that insists upon a perfect knowledge of the tools of the mind without permitting, during school hours, the employment of those tools to any permanently useful ends; that incessantly drills upon forms without furnishing any nourishing content to fill the forms; that, in short, continues to postpone indefinitely from day to day and year to year a real education and emphasizes the process of ever preparing for an education—such an organization is certainly not based on logic. Such, however, has been, and still is, the character of much of our so-called education of the elementary school in particular and of the high school in general.

Origin of Present System.—The present organization of our public schools harks back to the days of the free academies which arose shortly after the close of the Revolutionary War. Many of these institutions offered a curriculum which began with the veriest elements of learning and ended with subjects that are now found in the colleges. The academies early adopted the practice

of grouping the work into departments; as, for example, the first primary, second primary, intermediate department, grammar department, academic department, and collegiate department. Each of these departments included the school work of two or three years. Inasmuch as the entire course was planned to occupy the time from about one's eighth or ninth year of age up to his eighteenth or twentieth year, the course came to be one of about ten or twelve years in length. Thus the academic work of two, three, or four years came to rest upon a pre-academic study of eight or nine years.

With the rise of public union schools the form of the academies was adopted almost unconsciously. So, also, was the nomenclature. Gradually the expression "high school" took the place of the "academic department," and the later school inherited all the traditions, ideals, and customs of the earlier one. Thus it was that temporary expediency, followed later by unreflecting imitation and blind conservatism, saddled upon America a system of public education that consists almost everywhere of a high school of four years resting upon an elementary school course of eight or nine years. Thus it was established that the only door opening into the high school led out from an elementary school of eight or nine years' continuous tuition. There was no alternative course offered—eight years to get ready for an education and *then* four to acquire the education, or perchance to *prepare* further for an education that was still remotely beyond.

Not until recently was any attention given to individual aptitudes and capacities. Straight ahead for at least one year each was obliged to go, advancing one stage to continue the process, or else, in case of failure, going

drearily over the former course another year. There was no differentiation; all subjects were demanded of every pupil, whatever were his ambitions or his life's plans. All the work was formal, and, to the majority of students, devitalized, tedious, and aimless.

Recent Attempts at Improvement.—Only within the past twenty years has concerted effort been made to improve these conditions. Dissatisfaction with the old order first found expression in the Report of the Committee of Ten in 1893. An enriched curriculum, a flexible curriculum, and an articulating curriculum were their demands. The report also urged the extension of certain well-recognized secondary school subjects down into the elementary grades, the departmentalizing of some work below the high school, and a corps of better trained teachers employing better pedagogical methods.

The committee through its report set up ideals. Here and there serious efforts were made to put the suggestions into practice, but in many respects improvement has been slow. The conviction has steadily grown, however, that complete reform can come only with a complete reorganization of the school system. A six-year course for the elementary school and a six-year course for the high school is the slogan for the more recent agitations. To lend support to this proposal the National Education Association, in 1905, appointed a standing committee on a six-year course of study for high schools. For three successive years this committee has made an annual report, and sentiment is rapidly crystallizing in support of the above plan.

Objections to Present System.—It may be well at once to present the indictment made against our present educational system. The counts are as follows: (1) The

curriculum is overcrowded; (2) there are duplication and waste in administration; (3) there is little correlation of subject-matter; (4) exaggerated attention is given to unessential and impracticable topics; (5) many topics now presented have no legitimate place in any curriculum; (6) pupils are overworked; (7) the course of study is inflexible; (8) there is no close articulation of the elementary school with the high school; (9) individual tastes and capacities are not rightly considered; (10) promotions are based upon an unsound principle; (11) discipline is unsuited to the stage of development of the pupils; (12) teachers are improperly equipped; (13) pupils are influenced by too few different personalities; (14) methods of instruction are unpedagogical; (15) the study of many secondary subjects is postponed beyond the proper time for their best presentation; (16) work is not effectively vocational; (17) enormously large numbers withdraw from school; (18) insufficient attention is paid to the retarded pupils and to those of superior ability; (19) there is not sufficient hand work; (20) specific trade instruction is lacking; (21) the whole system is over-mechanized.

This is the bill of indictment. It is being examined point by point by the grand jury—the people of the land—and a true bill is being found. The duty devolves upon the experts in education to prosecute and to correct.

The Seventh and Eighth Grades.—While some of the alleged unsatisfactory conditions are to be found throughout the entire system, and some few in the high school alone, the great plexus of evils is in the seventh and eighth grades. Here is the great battle-ground of educational reform to-day. "Rearrange the work and ad-

ministration of the seventh and eighth grades," say the propagandists, "and readjust the other grades to the reformed plan and the more oppressive evils of the entire system will have been eradicated."

Plans for Reorganization.—The reorganization and remodelled administration of the work of the seventh and eighth grades, therefore, constitutes the crux of the problem. The analysis of the unsatisfactory conditions found has given rise to the idea of redividing the present twelve-year course, six grades to constitute the elementary school, and six the high school. The theory is that six years are amply sufficient to encompass the elementary ground, and that the seventh and eighth grades should assume the character of the high school and adopt its forms and methods. In addition the new theory demands that the work of these upper six grades shall be reorganized throughout. What in detail should be the plan of reorganization thus proposed, and what advantages and disadvantages will issue?

Distinction Between Elementary and Secondary Education.—First, what constitutes elementary, and what, secondary education? Dewey asserts: "The aim of the elementary school is wrong. It should not be knowledge, but to organize the instincts and impulses of children into working interests and tools. The stress should be on methods, not results. Not that we do not want results, but that we get better results when we transfer the emphasis of attention to the problem of mental attitude and operation. We need to develop a certain active interest in truth and its allies, a certain disposition of inquiry, together with a command of the tools that make it effective, and to organize certain modes of activity in observation, construction, expression, and reflection.

Six years ought to be enough to accomplish this task.”¹ Hanus sums it up as follows:

“The special aims of elementary education are: (a) To nourish the mind of the child through the course of study which should comprise an orderly presentation of the whole field of knowledge in its elements, and to provide an opportunity for the exercise of all his powers, mental, moral, æsthetic, manual, or constructive, through good instruction and wise discipline; (b) to guard and promote his normal physical health and development.”²

Thus it appears that elementary education, besides promoting and strengthening one's physical health, has for its chief aims the opening of the mind to the entire world in its elements, the development of interests in the world and in its activities, and the fostering of desirable habits of mind and body. It should emphasize chiefly the formal aspects of education. Its mission is to prepare for further school work. Its end is *extra se*. It aims not at knowledge itself, but at supplying the tools of the mind and at inculcating attitudes and habits of mind that will enable the individual later to pursue knowledge and industry. As Dewey says, “Six years ought to be enough to accomplish this task.” Recent experiments demonstrate that, in many cases at least, they are.

What now is secondary education? To this question Hanus replies: “The secondary school should especially promote the discovery and development of each pupil's dominant interests and powers; and further, it should seek to render these interests and powers subservient to life's serious purposes, and also to the possibility of par-

¹ *School Review*, vol. 1, p. 18, 1903.

² “Educational Aims and Educational Values,” p. 17.

ticipation in the refined pleasures of life." He adds: "The serious purposes of life are first, self-support, or, when this is unnecessary, some worthy form of service; second, intelligent active participation in human affairs. . . . The refined pleasures of life are found in the ability to participate with intelligence and appreciation in the intellectual and æsthetic interests of cultivated men."¹

E. E. Brown, former United States Commissioner of Education, declares the "business of secondary education" is "to raise all subjects which it touches to the plane of science by bringing all into the point of view of organizing principles." In another place he says that the purpose of secondary education is "to seek an understanding of the living growing persons who go to school and to treat them in a way to promote their healthy growth. . . . This is on one side leading toward individualism; it demands free election of studies and individualized processes of instruction. On the other side it shows how dependent the pupil is on society. Neither the future nor wholly the present are our concern, but both."²

The aim of secondary education is conceived by Lid-deke as "an elementary knowledge of facts, truths, and laws of relation in the domain of science, history, government, and literature; a fuller development of loyalty to the bettering influences, culminating in due time in seriousness of purpose; last and most important, depth of insight, sanity of judgment, and the power of adapting means to ends."³

Here, then, is the distinguishing characteristic of secondary education: It is that education which lays

¹ *Ibid.*, p. 81.

² "Tendencies in Secondary Education," *School Review*, vol. 9, p. 446.

³ *School Review*, vol. 12, p. 636, 1904.

stress upon gaining a systematically arranged content of knowledge, and that seeks first to discover for each pupil his real dominant interests and aptitudes; and, secondly, so to train and develop these incipient powers that each may put into life as much social service as possible, and simultaneously derive from life as much personal satisfaction as may be. Trained individuality—that is the end and aim of the secondary schools; but a trained individuality that ever recognizes these principles: that individual progress and happiness are always dependent upon the progress and happiness of all the other members of the social group, that whatever serves the best interests of the social whole serves at the same time the best interests of the individuals who compose that whole, and that the distinguishing characteristics of individuality are a trained and accurate judgment and a vigorous persistent will. Active social co-operation, clear judgment, and effective execution are, however, produced solely through the repeated exercise of these incipient powers. Hence the prime function of the secondary school is to afford abundant opportunities for the development of these processes.

Result of Recognizing the Distinction.—The realization of these principles demands, as previously suggested, that the high school curriculum be extensive in scope and rich in content; that the subject-matter be so organized and presented as to reveal its essential interrelations; that the administration of the school be so directed as to give opportunity for self-discovery and self-development, and that such agencies and methods be employed as will stimulate to some worthy form of social service and fit each individual, at least in a general way, to become an efficient worker in his chosen field.

Proposed Changes in Organization.—To accomplish just these ends is the purpose of the present agitations looking to a modification of the public school system. Moreover, there can be little doubt that such a reorganization is at hand and that it is about to adopt the essential features of the equal division arrangement of grades. The six year high school is not an unknown institution to-day,¹ but heretofore, for the most part, it has arisen by extending the scope of the work upward to include two additional years, and has left the elementary grades unaffected. The present movement seeks to extend the scope downward, and is being stimulated by current reforms made in European countries and in Japan. Such a plan seems feasible, just, and advantageous. Under it the first six grades will constitute the universal school. In the second six years differentiated courses leading to various goals will exist side by side. Here the scope of the work will be as wide as human interests, but the principle of individual election of subjects will, to a considerable degree, have to be established. Here will begin the training in choice, the training of the judgment and the practical will, but obviously no individual should at the outset be given *carte blanche* in his elections. Power and strength come from the gradual exercise of independence, from choices supervised throughout the entire course.

Hence, from the start provision should be made for at least *five distinct groups of pupils*. First, there will be those whose abilities, ambitions, and resources will lead

¹ In 1909 twenty-two cities, distributed over twelve different States, professed to have their high schools organized on the basis of six years.—“Report of the Committee on a Six Year Course of Study,” *Proc. N. E. A.*, 1909, p. 498.

them not only to aim at completing the full high school course of six years, but also at attaining a college education as well. *Secondly*, there will be a fairly large class whose scholastic interests and ambitions will lead them to pursue systematic study no further than high school graduation, but who, nevertheless, may, without hardship, defer the choice of a vocation and the training therefor until after graduation. A *third* group will be composed of those who are enabled to complete the high school course, but whose circumstances necessitate the entrance upon a vocation immediately upon leaving school. These must, therefore, receive their systematic vocational instruction, if at all, before leaving the high school.

A *fourth* class will be those who may continue their schooling a year or two beyond the compulsory school age, but who probably will not complete the entire course. These, like those in class three, must obtain whatever practical training and vocational insight they are to receive while yet in the public schools, and must obtain this training at a relatively early stage. *Finally*, there will be a *fifth* class, a very large class, who will leave school at the end of the compulsory school age and go at once into the industries. This class in the past has received least consideration. In the newer regime its members will be put on a parity with all the other classes, equal educational opportunities for every individual in the state being a practical ideal.

New Arrangement of High School Courses.—This grouping suggests that the work of the newly constructed high school must correlatively be organized into at least five fundamental courses of study. These are:

(1) *The College Preparatory Course*, offering considerable work in English, foreign languages, mathematics,

science, history, manual training, and other academic branches.

(2) *The General Course*, affording opportunity to explore many fields of learning, but wisely requiring concentrated attention upon at least one of them. In this course would also naturally fall subjects in applied arts for girls, and domestic science.

(3) *The Commercial Course*, laying emphasis upon the various branches that relate peculiarly to business and to commercial interests and administration, but not neglecting the branches essential to a broad general outlook.

(4) *The Short Business or Clerkship Course*, giving an opportunity to such as demand it to fit themselves for positions as clerks, stenographers, and secretaries within the maximum period of four years, and enabling them thus to complete their schooling at the end of the tenth grade.

(5) *The Industrial (or Agricultural) Course*. This course would doubtless in most cities have to be differentiated into four sub-courses, viz.:

(a) General industrial work for boys, giving a training in general mechanics for those whose aim is to work in factories with machinery.

(b) General industrial work for girls, a course co-ordinate with the general industrial course for boys.

(c) Trades instruction for boys, giving instruction and training to such as will own their own tools and work for themselves. Here would be found such instruction as blacksmithing, laundering, and tailoring.

(d) Trades instruction for girls, correlative with the trades course for boys. Here would be taught millinery, dress-making, library work, nursing, cigar making, and similar vocations.

Place of Vocational Instruction.—This arrangement of courses frankly recognizes vocational instruction as having a legitimate place in the public school system. Believing, as we must, in the democratic principle that no person can ever acquire too much education of the right kind, and believing, further, that in a democratic state every member should be given equal opportunities to secure an education commensurate with his aptitudes and ambitions, we must of necessity believe that it is incumbent upon the state and to its own best interests that it provide a system of education that shall appeal, through its varied subject-matter, to every class of individuals. Not to do this would savor of aristocracy, not democracy.

New Methods of Organization.—If the work of public secondary education is to begin with the seventh grade, certain changes in the administration of the schools will be necessitated. There are four distinct methods of organization and administration that may be employed. Each offers some unique advantages. Each lends itself to adoption *in toto*, or in combination with the essential elements of each of the others. These four methods are:

(1) Continue the external form of the schools as it is to-day, but introduce into the seventh and eighth grades the principles now obtaining in the administration of the high school.

(2) Bring the seventh and eighth grades into the high school building, and organize and administer all work above the sixth grade as a unit, both respecting external form and internal operations.

(3) Make a complete differentiation of schools and of subject-matter from the very beginning of the seventh grade.

(4) Group the seventh, eighth, and ninth grades by themselves as a junior high school, and the tenth, eleventh, and twelfth grades by themselves as a senior high school.

The First Method.—The first method leaves the elementary schools outwardly in much the same condition as to-day. Each would continue to serve the general educational needs of the district in which it is located. Pupils would be expected to complete the course of study in the neighborhood school, and then, if they so chose, to pass to the high school building. Nevertheless, under the new plan of organization the general principles of administration now found in the high school would be carried down into the seventh and eighth grades of the ward schools. Here would be provided a modified form of departmental teaching, an enriched curriculum, a closer approach to the idea of student responsibility, greater flexibility in promotion, and other practices characteristic of secondary education.

A system of this kind is feasible and advisable in small towns and cities that are relatively homogeneous in character and interests. In communities composed of heterogeneous classes possessed of widely differing interests, the plan offers difficulties. If, however, these classes are somewhat segregated geographically, and if the population of the town is such as to require the employment of several elementary school buildings, most of the obstacles can readily be overcome. The solution obviously will be to differentiate the work among the seventh and eighth grades of the various elementary schools. In each school would naturally be found all of the fundamental subjects of study, but beyond these each school might well be organized so as to lead to a more or less definite goal. Thus, in the seventh and eighth grades of one building, the

preacademic subjects may be emphasized; in a second building elementary commercial studies may constitute the centre of work, and in a third building attention may be given largely to industrial training.

Naturally, this reorganization of the work of the seventh and eighth grades would require some correlative changes in the organization and administration of the upper four grades. Close articulation would be essential. Other adjustments would also be necessitated. The problems, however, which arise here are precisely the problems that will arise in connection with one of the other plans for reorganization and may be considered later. It is clear, though, that this entire first plan is full of objections. It is a makeshift at best. In homogeneous communities of small size it is workable; in heterogeneous communities of larger size it is cumbrous and awkward. Its only claim for consideration is that it is economical.

The Second Method.—The second scheme for organizing the new type of school is to segregate all pupils above the sixth grade in one school building, the high school, and there organize the work in several parallel courses. This plan merely takes the seventh and eighth grades out of their present setting and merges them with the present high school. They thereby are brought fully under the principles of administration dominating in present-day secondary education. Departmental teaching, limited election of studies, scientific methods of instruction, a freer spirit of regulation and control, all are to be henceforth the birthright of the seventh and eighth grade students as they are at present of the pupils of the four upper grades.

This second arrangement is adapted to the conditions and needs of towns of moderate size. Wherever one high school building can accommodate all pupils above the

sixth grade the plan is highly commendable, as it affords the maximum of benefit at the minimum of expense. Towns of 8,000 inhabitants or less can, with almost no difficulties, reorganize their school systems on this basis. The efficiency of the school thus reorganized will many times repay the small additional expense entailed.

The Third Method.—In the third alternative scheme a differentiation in aim, in subject-matter, and in buildings is implied at the outset. From the sixth grade the ways diverge. All school work beyond this is organized, not in separate and distinct courses within a single school, but in separate and distinct schools themselves. The number and variety of these is obviously to be determined by the demands of the pupils. This plan will best serve the interests of the large city. Ordinarily, in its complete organization, it will call for seven distinct types of schools. The number of each type required for any given system will depend, of course, on local conditions. These seven general types are: First, the college preparatory school; second, the engineering school (the manual training school); third, the high school of practical arts for girls; fourth, the high school of commerce; fifth, the business school; sixth, the trade school for boys, and seventh, the trade school for girls. In some sections there will be need for a school of still different type—the agricultural high school.

Little adverse criticism directed against this system is possible. If provision be made for the free choice of the type of school to be attended; if attendance on classes in two or more schools by the same pupils be permitted, or, on application, elected subjects be incorporated in the curriculum of each school; and if, finally, the daily transportation of pupils to and from school be borne by the

municipality whenever necessary, this plan is desirable. Whatever may be the intrinsic merits of the other plans, for cities like Boston, Philadelphia, New York, Chicago, St. Louis, and San Francisco they are impracticable. Indeed, for any city of 100,000 inhabitants or more this third plan, with slight modifications, is alone feasible. The charge that any system of schools which seeks to differentiate the work in separate buildings is undemocratic, tending to introduce class distinction, is beside the mark. Providing for individual aptitudes and interests under separate roofs is in essence no different from providing for individual aptitudes and interests in separate courses of study under the same roof. To-day the field of knowledge is wide; the demand for specialized training is insistent. Practically the two interests cannot be made to coincide. Differentiation of some sort is inevitable. It is immaterial whether this take place between buildings, between courses in the same building, or between recitation classes in the same room.

The Fourth Method.—The fourth scheme of reorganization calls for the division of the six high school grades into two equal parts, each division to occupy a building by itself and to be styled, respectively, the junior high school and the senior high school. This plan seemingly possesses many advantages for cities and towns ranging in population from 8,000 to 100,000 inhabitants.

Since, in the nature of the case, the numbers enrolled in the senior school will always be smaller than those in the junior school, more ample provisions must necessarily be made for the latter. In cities in which one school of each class will meet the needs, it seems advisable that the two buildings shall be located in close proximity. Where this is done, the more advanced school will continuously

serve as a tangible, visible stimulus to the pupils of the lower school. Under this arrangement, the work of the junior high school will include one grade that will fall beyond the limits of the compulsory attendance law. Since the work of this year, however, will be organized as a homogeneous portion of a continuous course, the tendency of the pupils to withdraw from school at the end of the compulsory period will be greatly minimized. Moreover, the ideals and spirit dominating the work of the senior school will, to a greater or less degree, be carried over into the junior school. If, in addition, a close articulation be established between the courses of the two schools, and if no special official recognition be given to those who have finished the compulsory school course and no "graduating exercises" be held at that time, it is safe to assume that many, who would otherwise abandon school at this period, will be encouraged to continue their work, not only to the end of the junior school course, but on into the senior high school. It seems certain that this idea is destined to become popular. Indeed, it is already in successful operation in several cities, notably Berkeley, California, and Columbus, Ohio, and other cities are seriously considering its adoption.

In many towns in which a single senior high school will amply serve the needs, a single junior high school will not do so. In these cities a modified plan, incorporating the usable elements from each of the other three plans, will be necessitated; that is, two or more junior high schools, offering similar or differentiated work, as local interests may dictate, may be required. Where this is the case, convenience will doubtless demand their distribution in the various sections of the districts. Each of these four plans possesses peculiar advantages for different types of

cities. The dominating principle is, however, the same, and by interpreting and applying this to the particular conditions, equally meritorious and efficient systems may be secured.

Equipment of Buildings.—Every school building—the junior high school, senior high school, and the independent high school—should be provided with assembly halls, gymnasiums, class rooms, libraries, laboratories, art rooms, museums, and conservatories. Every junior high school, every elementary school used by the seventh and eighth grades, and every differentiated high school offering work in the manual arts or in the trades should, in addition, possess ample facilities for much handwork for both boys and girls. All schools should be provided with out-of-door recreation grounds or athletic fields, supplied with all necessary apparatus, and presided over by skilled directors of sports.

Supervision of Elections.—The administration of the work within any of these schools need not differ from the administration to-day employed in the best four-year high schools. The principle of large individual election of studies must, of necessity, pretty generally prevail. Certain fundamental branches may rightly be required in every course, and in almost every grade in the course. For the rest, youthful judgment should be supervised, guided, and directed.

Time may well be taken at the beginning of every school year to consult seriously and sympathetically with every pupil respecting his aims, ambitions, and choice of studies. For this purpose an advisory committee should be formed for every single individual. By this committee the curriculum of every pupil should be analyzed and, if necessary, remodelled. As members of this com-

mittee should invariably be found the following persons: (1) The student himself, who should be encouraged to give free expression to his ambitions, purposes, and likes; (2) the parent, parents, or guardian of the student, who should make known the parental desires, the resources at the student's service, and the co-operation that may be expected from the home; (3) the pupil's former teacher, or teacher-adviser, who should be able to present a fair judgment of his abilities, aptitudes, and habits; (4) the prospective teacher, or teacher-adviser, who should know the difficulties that lie before him and should be able to advise respecting them, and (5) the principal of the school, who, as moderator, should harmonize the conflicting or varied considerations and direct the boy along the course best suited to his needs. The administration of a project of this kind will require time, patience, and judgment, but it can be made of inestimable value. If necessary, the whole month of August (or late June and early July) should be devoted to this work rather than that it should not be done at all, and adequate special compensation should be provided for such services.

Importance of Departmental Teaching.—In each type of the newly organized secondary schools departmental teaching should invariably be provided for every grade. The reasons for this change are obvious. No teacher, however well adapted for her work by nature, or however well prepared by training, can teach a variety of subjects equally well. There must be concentration of effort. The really efficient teacher requires time for intensive and extensive preparation for each lesson, and energy for vitalizing class-room procedure, for disposing of routine duties, and for inspirational reading, social intercourse, and relaxation. These means to continued growth are

imperative for all. The more experienced and skilful a teacher becomes, the more fully are these truths recognized and the more completely are they realized. Trained skill alone can never produce a teacher of highest merit and power, but for successful teaching of adolescents specialized training and expert knowledge are absolutely essential. Before the inquiring critical mind of the developing youth no teacher can stand firmly who cannot inspire pupils with the confidence which a mastery of the situation affords. Departmental teaching in the seventh and eighth grades can insure the high standard of scholarship which is an obvious professional necessity.

By departmentalizing this work, other highly desirable qualities in teachers can be assured. By making the salaries of the teachers of these two grades from ten to twenty per cent higher than the salaries of the teachers of any other grades in the system, qualified candidates will soon be available. The new recruit, the mediocre teacher of experience, and the cold, egoistic specialists may be tolerated on the instructional staffs of youths whose school habits have been somewhat definitely fixed, whose course in school has been pretty clearly determined, and who have acquired a fair degree of independence, judgment, and self-direction. But from junior high schools these types of instructors should be rigidly barred. Many pupils will be lost to the schools during the adolescent age under the best of conditions, but inspiring teachers, much handwork, and much physical exercise and play should reduce the loss to a minimum.

There are additional advantages to be derived from this departmentalization. First, such an arrangement permits pupils daily to come under the influence of several dominating personalities. Child nature is extremely im-

pressionable. One all-powerful influence at this time may set the form beyond reshaping, whereas the influence of several personalities with their inevitable elements of difference will tend to harmonious development. One-sidedness in early youth, however noble the controlling characteristic, is undesirable.

The departmental organization likewise helps to satisfy the inherent impulse for movement. Pupils at this stage demand change of environment, change of bodily posture, and variety of teaching methods. Under the departmental system the passage of pupils from room to room, the changes in environment found in those rooms, and the differences in voice, manner, and methods of the several teachers provide needed variation in school life. Under it a freer discipline than exists at present is possible. To-day when one division of the pupils is required to be independently occupied at their seats while a second section is engaging the immediate attention of the teacher, an approach to military discipline is inevitable. This damper on social intercourse frequently stifles interest and checks natural development.

Self-Activity the True Principle of Growth.—The true principle of growth has, in theory, long been recognized as that of self-activity. The true aim of any school is gradually to transform the dependent being into the independent, self-directive individual. Independence comes, however, from the exercise of power, not from its repression. Prolonged dependence is destructive of personal judgment and personal initiative. Under a system in which this principle holds sway there can be no spontaneous nor perfect growth. Activity here receives its stimulus from without; and weakness, not strength; timidity, not courage; a tendency to uniformity, not individuality, ensue. The exaggerated employment of this

principle accounts in no small degree for that abuse of freedom witnessed so often among boys and girls as soon as they emerge from the system. They are wholly incapable of wisely assuming responsibilities when external authority is removed. The new plan offers facilities for obviating these evils of discipline. Under it much of the free spirit, order, and motivation that characterize adult social intercourse can be introduced, and gradually the pupil may be trained in self-direction. Social co-operation becomes the key word of the system.

Advantages of New Plan.—Again, the proposed scheme of reorganization will render the administration of school work much more flexible. To-day the administration of the seventh and eighth grades is too often criminally rigid. Promotion is commonly made by grade, or half-grade at the best. Little account is taken of the peculiar interests and talents of any pupil. Pupils who fail to attain the required standard in one subject are declared to have failed in all, and are forced to repeat the work of the entire grade, or half-grade. The youth of exceptional versatility and capacity is kept back with the rest. Such a process is deadening to any full-blooded individual. An ænemic, timid, plodding boy may accept the unjust requirement without question, but he is injured nevertheless. The repetition of a dull routine from which all zest of novelty has been taken merely intensifies his subservience and stifles his curiosity. On the other hand, the vigorous, individualistic, active boy recognizes the injustice and resents it. External force alone can then longer keep him in school, and even so, initiative will have been blunted, interest cooled, and accomplishments reduced.

Under the proposed plan promotions can be made semi-annually or quarterly *by subject*. Moreover, in large schools with many sections in the same subject it permits

the organization of classes for the supernormal (the A section), the normal (the B section), and the subnormal (the C section). By setting the class periods of the three sections all at the same hour transference from one section to another will be easy. Thus, for illustration, a pupil especially apt in mathematics, good in history, but of mediocre ability in English could enter the A section in the first, the B section in the second, and the C section in the third. His continued membership in any of these sections would be dependent on his progress *in that particular subject*. In this manner there would be neither undue advancement nor unjust retardation. Each pupil would proceed through the course as rapidly as his capacities and efforts would permit, or as slowly as his limitations necessitated.

In the lengthened school course many really secondary subjects can be begun one or two years earlier than is now generally possible, and can be continued till they will have yielded fuller benefits. Ancient languages, especially Latin; modern foreign languages; the simpler processes of algebra and geometry; elementary science; elementary sociology; political economy and civil government, and, probably, the elements of other so-called advanced subjects, can best be begun in the seventh grade. Educational psychologists and many foreign authorities assure us that the best time for beginning the study of these branches is at the dawning of the adolescent period. In England and Germany boys commonly begin the study of algebra and geometry as early as their eleventh or twelfth year, and seem to find no insurmountable difficulties. In fact, they often come to possess a firmer grasp of the subjects than do the majority of the graduates of our high schools. Beginning the study of foreign language in the early stages of adolescence is especially desir-

able. Then the language can be taken up naturally, as a native youth would begin it. Then simple conversation and the reading and writing of simple familiar words and sentences can constitute the methods of attack, whereas the sensitive self-consciousness of later life renders such a procedure difficult.

At this early age, too, pupils are intensely interested in the larger and more generally familiar questions of natural science, sociology, and political economy. This is the period for presenting to them the entire world in its elements and for inculcating in them desirable habits of reaction toward its various forms and institutions. Here is the proper time for introducing an elemental knowledge of sex and sex hygiene. Here properly belong also the beginnings of vocational instruction, and, for many, the beginnings of vocational training itself. Indeed, the only credentials of eligibility any subject should be forced to bring should be: Will its incorporation in the curriculum meet a real demand or fill a felt need?

Guiding Principles in Administering Reorganized School.—What shall be the guiding principles for administering a reorganized school of this kind? The answer is in part implied in reasserting that there shall be an enriched curriculum, with a wide range of elective subjects, and departmentalized grade work. In addition the old-time recitation period will require modification. In the past too great an emphasis has been placed on memorizing facts, whereas the function of the school is to develop mental power and to habituate the possessor to applying this power to serviceable ends. There will always be a place for the drill lesson, but it must no longer be permitted to monopolize school work. Preceding or supplementing it must be frequent study recitations in which the subject is developed and mastered under the supervision

of the teacher. Simultaneously or consecutively ample opportunities must be provided for converting this knowledge into faculty. No longer should impression be divorced from expression.

Increased Burden of Teacher.—All this implies that henceforth a much greater burden of the school work must be borne by the teacher. "Hearing lessons recited" will constitute but a minor function. *Henceforth the teacher must teach*, and teaching calls for an inexhaustible supply of resourcefulness, tact, and knowledge. Henceforth correlation and vitalization must be fetishes of the class room. Instruction, questioning, criticism, exposition, suggestion, example—all must be employed, but none of them to the detriment of pupil initiative and co-operation. Moreover, while correlation with kindred or similar facts of other school branches is excellent, constant correlation of school work with the pupil's life experiences is indispensable.

The Curriculum.—The curriculum of the six year school must obviously include fundamental subjects required of all pupils and optional studies open to individual election. What branches shall be constants and what variables must of necessity depend somewhat upon local conditions and on the specific aims of the school. Two general principles should, however, be operative everywhere. First, each pupil leaving school, at whatever stage, must be given a systematic, many-sided, functioning education that is imperfect only in the sense that it is incomplete; and secondly, he must have received in addition a somewhat special training in a limited range of knowledge or activity. That is, each pupil must have a somewhat sharp focal point in school life and a relatively extended marginal boundary radiating from it.

Such an ideal, therefore, calls for a clearer classification of subject-matter. The departments of knowledge that should find place in the new programme of studies are:

1. English language and literature.
2. History, civics, and geography.
3. Ethics and sociology.
4. Mathematics.
5. Ancient foreign languages.
6. Modern foreign languages.
7. Physical and biological sciences.
8. Physiology and hygiene.
9. Business administration and commerce.
10. Commercial work.
11. Mechanical and free-hand drawing.
12. Manual training (for boys).
13. Home economics, domestic science, and art (for girls).
14. Music and fine art.
15. Voice culture, public speaking, and dramatics.
16. Physical training.
17. Agriculture and horticulture.
18. Industrial training.
19. Elementary philosophy.

This curriculum, as extensive in scope as that of many a college, is advocated because the theory frankly recognizes the six-year high school as a people's college. Within many of the departments here mentioned should also be found a further recognition of the fact that there must be a differentiation of content and of methods to meet the needs of the various social classes. Thus, the work in English language and literature should certainly be somewhat different for the boy preparing for college and for the one pursuing a commercial course or for the one seek-

ing to prepare himself for a particular industry or trade. The same is true of mathematics, history, foreign languages, and other branches. This differentiation may come (in small schools it must come) in the regular classroom work itself. It, however, may come within divisions or sections of pupils pursuing the same branch of study in the same school; or, finally the differentiation, as formerly suggested, may come between schools.

In the seventh and eighth grades each pupil's course of study should include: (1) English; (2) history, civics, and geography; (3) ethics and sociology; (4) physiology and hygiene; (5) mathematics (including arithmetic, algebra, and geometry); (6) elementary science; (7) manual training (or household economics, domestic science, and arts); (8) music and fine art; (9) drawing; (10) voice culture, public speaking, and dramatics; and (11) physical training. In addition opportunity should be given for one or two or three elective studies.

Obviously a course of study of this scope will require the abandonment of the old-time practice of devoting five class periods per week to each subject. Indeed, educational theory advocates this. Psychological investigation has clearly shown the desirability of intense but non-continuous mental stimulation. Under it there is secured an economy of mental effort, a greater variety and permanence of associations, more mental discipline, and a clearer and a more adequate comprehension of the subject. This fact is peculiarly true with respect to all studies that call for considerable perspective. Time is required for assimilation. By alternating periods of rest with periods of intensified attack, associations are multiplied and correlations strengthened. European peoples have for years acted upon this principle.

Study Under Supervision.—Correspondingly this change in hours of recitation demands a lengthened school day. Home study, as it is now planned and administered in America, is not assured, effective, or economical. The proper place for learning lessons is in the school under the supervision of trained experts, not in the home amidst confusion with little or no co-operation or aid. Relatively few adults possess the capacity and energy to sit down and apply themselves to mental tasks that require undivided attention and individual effort through a long period of time. The immature youth cannot be expected to do so.

The great majority of one's ideas, habits, and feelings are prompted by force of suggestion, example, and instruction. Original thought and uninspired initiative are almost unknown. It follows that the greater the opportunity for study under expert supervision, with this fund of suggestions, examples, expositions, the greater will be the progress made. A school day that affords two or three hours for study of this kind is much to be desired. Indeed, an academic day extending from 8.30 A. M. till 4 P. M. (with a noon intermission of moderate length) seems to be feasible and desirable. In addition to this a recreation day extending from 4 to 5.30, in which *supervised* physical training and athletic sports shall be required of all, constitutes a workable ideal. Under such a system home study can be eliminated or at least reduced to a minimum.

Suggestive Course of Study.—An acceptance of the salient principles above suggested will lead to the adoption for our reorganized secondary school of a course of study that is at the same time extensive, intensive, and practical. Such a suggestive course of study is herewith presented.

A SUGGESTED PROGRAMME OF STUDIES FOR A SIX-YEAR HIGH SCHOOL

SUBJECTS	GRADES						TOTAL	GRADUATE WORK
	7	8	9	10	11	12		
	HOURS PER WEEK							
1. English and Literature...	*4	*4	*4	*4	3	3	22	Special work in any branch for which five pupils apply.
2. History, Civics, and Geog.	*3	*3	*3	3	3	3	18	
3. Ethics and Sociology....	*2	*2	*2	..	..	..	6
4. Mathematics: Arith- metic, Algebra, Geom. and Trigonometry... }	*4	*4	*4	3	3	3	21	
5. Ancient Languages:								
(a) Latin.....	4	4	4	4	3	3	22	
(b) Greek.....	..	..	..	4	4	3	11
6. Modern Foreign Lan- guages: (a) German..	4	4	4	3	3	3	21	
(b) French.....	..	4	4	3	3	2	16	
(c) Spanish.....	..	..	4	3	2	2	11
7. Phys. and Biological Sci.	*2	*2	†6	†6	†8	†8	32	
8. Physiology and Hygiene.	*2	*2	*2	..	..	1	7
9. Manual Train. (for boys)	*3	*3	†6	†6	†8	†8	34	
10. Home Economics, Do- mestic Science and Arts (for girls).....	*3	*3	†6	†6	†6	†6	30	
11. Business Administration and Commerce.....	2	2	4	4	4	4	20	
12. Commercial Work.....	3	3	†6	†8	†10	†10	40	
13. Mechanical and Free- hand Drawing.....	*2	3	4	4	4	4	21	
14. Music and Fine Arts...	*2	*2	2	2	2	2	12	
15. Voice Culture, Public Speaking, Dramatics.	*2	*2	2	1	1	1	9	
16. Physical Training.....	*2	*2	*2	2	2	2	12	
17. Agriculture and Horti- culture.....	3	3	†8	†8	†8	†8	38	
18. Industrial Training.....	3	†4	†8	†8	†8	†8	39	
19. Elementary Philosophy.	..	..	..	..	..	2	2
	28†	26†	17†	4†	0†	0†		

* Required subjects.

† Double periods with laboratory work.

‡ Indicates elective subjects may be added.

Advantages and Disadvantages of New Plan Compared.

—These, then, constitute the salient motives, principles, and plans for reorganizing the high school in America. The newer ideal possesses many improvements and advantages over the present four-year school. Does it also offer difficulties and disadvantages? Some, but these are of little weight compared with the benefits to be derived from the adoption of the reconstructed plan.

First, the reorganization of the school system, as suggested, will require some additional expenditure, both at the transition stage and afterward in administration and maintenance. Well equipped, well administered high schools cost more than elementary schools. But the increased benefits (if we trust psychology, pedagogy, and experience) are well worth the extra burden. What increased tax levy can outweigh even one superior boy who may thus be discovered, aroused, and moulded for large social service? Penurious economy in school work is false economy. There is no product America produces that is so valuable as its trained boys and girls. Many of the weaknesses and inefficiencies of our schools to-day are traceable directly to the stupid parsimony of the school boards, and to hazy conceptions of school administration.

Moreover, no school should inaugurate this reorganization abruptly. By incorporating one element at a time as rapidly as circumstances will permit, the entire ideal can, in a relatively short period, be actualized. Hundreds of schools have already taken one or more steps in this general direction. Departmental teaching in the seventh and eighth grades is no longer uncommon. The organization of the eighth grade with the high school, making it conform to these ideals and regulations, is an accomplished fact in many cities and towns. An en-

riched curriculum for the seventh and eighth grades is to-day somewhat general, while promotions by subjects and extra-term promotions are frequent.

Although the transition from the old organization to the new is, at least for our cities and towns, no difficult matter, in rural districts the facilities for thus reorganizing the school system are not so good. Even here, however, the obstacles are not insurmountable. The old-type district school is obsolete in theory if not in fact. It once served a social need and served it moderately well. In few compact communities to-day is it either economical or adequate. Consolidated schools have in many States taken its place, and no one who studies the situation carefully can doubt that the consolidated or township school can advantageously be established in many other districts.

In consolidated or township schools an organization in harmony with the plan recommended could be put into operation with no greater difficulty than in towns or cities. Indeed, the consolidated school becomes virtually a town school. Transportation of pupils at public expense has already been provided in numerous instances. It works no greater hardship upon pupils, and places no greater burden of taxation upon citizens than the old-time district schools. Consolidated schools (even as they exist to-day) are vastly superior in efficiency to those they have displaced.

Nevertheless it would be unwise for each consolidated school to offer a curriculum as extensive in scope as the best city schools may well do. Here, as in the towns, differentiation must be employed. One consolidated school may, however, emphasize agriculture, an adjacent township school may lay stress on commercial branches, a third may offer more thorough academic training. By

a system of county and State supervision and by a regulation permitting pupils who have attained the seventh grade to be transferred, at county expense, from a school of one type to a school of another type, in which are offered the studies he desires to pursue, the opportunity for the country boy or girl to receive an education in keeping with his or her taste and needs will have been made as complete as it is for the city youth.

From what has already been said it seems clear that the reorganized plan would hold more pupils in school for a longer period; would better prepare every type of student for whatever further study he might undertake, or for whatever vocation in life he might choose; would ameliorate the disciplinary and administrative burdens of all school officials; would make our system of education more nearly consistent with the well-established theories and facts of psychology, physiology, and pedagogy, and would be in harmony with the best practices of the more advanced peoples of the other parts of the world.

The movement looking toward an organization with the essential features similar to the ones above outlined is gaining momentum. I append the convictions of two well-known leaders.

Mr. A. S. Draper, Commissioner of Education for the State of New York, in an address before the Massachusetts Teachers' Association, November 26, 1909, spoke in part as follows:

"We believe that very generally the courses in the elementary school are too much prolonged, that the grades and the years are more than need be, that some unnecessary branches are included, and that some others are too attenuated, and that there are often more grades of textbooks than are desirable in one branch.

"Therefore, we shall soon recommend an elementary course of study with but six grades and nominally occupying six years, instead of eight, in the confidence that it will be more, rather than less, educationally efficient.

"We would follow this great and universal elementary school system, so simplified and strengthened, with a system of secondary schools, which for the present, and in our State, shall be distinctly separated at the very beginning into three great classes: first, the present literary high school; second, commercial or business schools, and third, general industrial or trade schools.

"The schools of the third branch are of immediate interest now. We propose that they occupy buildings that look like shops; that they be taught by workmen who can teach rather than by teachers with a little mechanical skill; that to a moderate extent they use books which are really germane to the work to be taught, but that their main instruments be machinery and tools—that they be much more shoppish than bookish. We propose that these schools be of two general classes, namely, general industrial schools, training in general mechanics those who will work in factories with machinery and many other workmen, and second, trade schools for those who will own their own tools and work essentially for themselves."¹ The salient features of this plan have since been incorporated into the New York system.

Superintendent Frank T. Bunker, of Berkeley, California, in recommending a plan of reorganization before the Board of Education, said: "The plan which I recommend involves reorganization and regrouping of the several grades of our school. Stated briefly, it is this: To have three groups of schools, one group (the high school

¹ United States Commissioner's report for 1910, pp. 101, 102.

proper) comprising the tenth, eleventh, and twelfth years only; the second group, which may be called the introductory high school group, comprising the seventh, eighth, and ninth grades only, and a third group of schools (the elementary schools proper), comprising all children of the first six years.

"An examination of this plan will convince one, I think, that the division of the grades into three groups is a much more natural one than the arrangement under which we are now working. . . . Statistics show that the masses are held in school no longer than through the fifth grade, and that at the close of the fifth grade they drop out in very large numbers, which means, educationally, that whatever is to be taught to the masses must be given in the first five or six years. . . . In the schools comprising this group I would have the course of study uniform for all children and somewhat narrow in its scope. . . . In the Introductory high school . . . children would enter at the period of adolescence when by nature they naturally crave an opportunity to dip into a wide range of subjects and activities. . . . I would have certain prescribed subjects for this group, but in addition thereto would permit as many elections as possible. . . . I should wish to see the work of this group made exceedingly rich in content and variety, and particularly in human interests. I should hope to see the work of this group relate very closely to life and be as far away as possible from that which is purely academic in education. I should wish much emphasis placed on learning how to study, how to use the library, how to get material from the same with expedition and judgment. If a child foresees that he wants to take German or Latin in the high school proper, I would wish him to begin these lan-

guages when he enters this group and thus have six years of work in the same before he enters college. . . . I should wish to see the work of this group shaped up to make a more easy transition from the work of the elementary grades to the departmental work of the high school. In line with this, I should wish teachers assigned to work in these grades who have a broad culture and a wide experience in the grades. . . . If this work which I have outlined be carefully and efficiently done . . . the incoming student [to the high school proper] will have developed a much more serious attitude toward his work than obtains at the present time; will have oriented himself better, so far as his subjects are concerned; and the break will not be so great or so discouraging as with the plan under which we are now working. Moreover, the students entering the high school proper will have developed a greater cohesion than now obtains. With our present plan students dribble into the high school in small numbers and from many schools. They are wholly lacking anything approaching a community of feeling or a feeling of group responsibility. They have had no experience in organized action and are not conscious of their individual responsibility in contributing to the establishment of a student body sentiment which shall be high and lofty in purposes and in its influence. . . . With three years of community life at the centres wherein the administrative methods are shaped to develop this responsibility, it would seem that the student would enter the high school proper at a much higher level with respect to student body morale than at present.”¹

This plan is to-day in complete operation in Berkeley.

¹ Pamphlet No. 2, pp. 2-10.

CHAPTER V

INSTRUCTION: ITS ORGANIZATION AND CONTROL

EDWARD C. ELLIOTT, PH.D.

PROFESSOR OF EDUCATION, UNIVERSITY OF WISCONSIN

The Meaning and Nature of Control.—The progress of human society has, at every stage, witnessed an increase in the number and complexity of the relationships maintained by individuals, acting singly and through organization. These relationships have developed from the fundamental needs of men—protection, food, communication, possession, ideals, etc.,—and in every society have produced for their attainment consciously organized and directed efforts that are called institutions. The more numerous and complex the relationships, the more highly organized have become the institutions. The more highly organized the institutions, the more necessary have become the means and methods whereby they may properly and economically perform their intended functions.

The institutions of our modern society are exceedingly complex, and becoming more so as human needs become more numerous and human relationships more complicated. The foremost demand upon the civilization of the present is for an efficient control of all institutions that contribute to the social welfare.

Education is the process of changing individuals from what they *are* to what they *become*. It signifies the transformation that qualifies human beings to live in helpful social contact. It is, therefore, one of the fundamental

needs of society and consequently of individuals. To meet this need the school has been established. The school, from this point of view, may be considered that institution, that bit of machinery, which society utilizes to accomplish a specific work; that is, to increase the effectiveness of the relationships which individuals and groups of individuals bear to one another.

Considered as a social institution, devised and operated for specific purposes, it is obvious that the school must be controlled and directed. It, like all other institutions, must be adapted to accomplish the results required of it. Its various parts must be brought into effective and economical relation to each other, so as to produce those changes in individuals most beneficial to the whole of society, to enable a direct response to the needs of men and to develop a clear understanding of their mutual dependence upon each other. This, in brief, is the function or work of school control.

The Forms of External Control.—It is evident that a large number of matters are involved in the work of organizing and directing the work of a school. Ideals must be conceived, general policies of action formulated, resources supplied, accommodations and equipment provided, and standards for teachers and instruction determined. If we analyze carefully the chief controlling forces of the school, it is possible to distinguish four distinct elements. These are: (a) the legislative, (b) the administrative, (c) the supervisory, and (d) the inspectorial. For reasons which will presently become apparent, it is essential to recognize these separate elements.¹ Each performs, as

¹ It may be insisted upon that the distinctions here pointed out represent more than formal, verbal differences. In fact, the confusion of these terms has hindered the development of effective school control,

it were, a different task and each involves activities resulting in special influences.

(a) *Legislative control* is that form of regulation exerted by the authority possessing final governmental jurisdiction. In the case of schools belonging to a public educational system, this control is usually centred in the legislature, by the sanction of which all public schools owe their existence, derive their support, and carry on their work. The only restrictions to legislative action are those defined by the fundamental law, the constitution of the State. Theoretically, the power of the legislature extends to all schools whether or not organized and directed as public schools. The schools maintained by religious organizations, as well as those known as endowed and private schools, are permitted to exist only through a grant of power from the State. This grant may be of a general nature, in the form of a constitutional guarantee of the freedom of the right to teach and conduct schools, or it may be of a special nature and in the form of a charter or legal incorporation. From a practical view-point the legislative control of non-public schools is exercised by the body possessing the immediate governmental power, as, for instance, the presbytery, general council, etc., of church organizations.

(b) *Administrative control* is that vested in the agents created by legislative action, or recognized as such by an implied legal sanction. Boards of education, boards of trustees, superintendents, inspectors, etc., are common types of such agents. Administrative activities have,

particularly of public schools. There is yet another type of control that may be designated as the *managerial*. In this classification managerial control is regarded as operating internally, and is considered as being made up of the activities within the direction of the class teacher.

however, certain special characteristics which distinguish them from those which are legislative, supervisory, or inspectorial. They are, first of all, general in their nature, in that they do not depend upon technical or expert knowledge for their successful performance. Furthermore, the duties and responsibilities of administrators are usually imposed and defined directly by law, or prescribed by an authority established in law for this purpose. This is the variety of control exercised by boards of education and other legally authorized bodies and persons in establishing and supporting schools, in providing adequate accommodations and equipment, in securing properly qualified teachers, and, in general, observing the restrictions and requirements of the higher legislative authority.

(c) *Supervisory control* depends for its effectiveness upon agents possessing technical and expert knowledge of educational processes, and capable of employing that knowledge for the development and advancement of the institutions coming under their control. Its mode of operation is, or should be, determined, not by the general or limited prescriptions of legislative enactment, but by the universal standards of scientific procedure. This is the variety of control that should be exercised by agents selected for this immediate purpose, directors, superintendents, supervisors, head-masters, and principals. Such control cannot become effective if exercised by laymen or those whose real duties are administrative. Whereas, administrative control is general in character and operates impersonally, supervisory control is special in character and properly operates with reference to individuals. A personal contact between the one supervising and the one supervised is a necessary condition. Above

all, skilled supervisors must directly produce constructive results.

(d) Closely related to supervisory control, yet to be distinguished from it, is the *inspectorial control*. This is also special in character and is based upon expert knowledge of the conditions and technique of successful and efficient instruction. It differs from the supervisory activity in that its special purpose is not personal, constructive service. Its aim is toward an impersonal, objective measurement of the results and worth of the school. Thus, narrowly interpreted, an inspector's special function is to pass upon worth and efficiency. A supervisor must do this and more; he must raise the worth and increase the efficiency.

Strictly speaking, each one of the several matters entering into the make-up of the school is subject in some degree to each one of the different forms of control indicated. There is legislative control of ideals, finance, buildings, teachers, instruction, discipline, and, in fact, all of the different features of organized education. There is likewise an administration, a supervision, and an inspection of each. Inasmuch as the immediate and limited purpose of this chapter is the discussion of the more important aspects of the control of instruction in secondary schools, an attempt to indicate fundamental distinctions between the several forms or varieties of control as applied to the instructional activities of these schools will now be undertaken.

Three Aims of Subject-Matter.—The subject-matter of instruction in any school, or scheme of education, may be said to represent three separate aims which, while closely related to one another, require independent consideration from the point of view of control.

The *programme of studies*¹ reflects the broad social purpose for which the school stands. It is a concentrated product of the experience of society, and its precise character at any time and place is determined by the larger fundamental needs of the society to which the school is responsible.² Its motive is derived, not from the special educational requirements of any particular individual, nor from the necessities of any single group of individuals, but is dependent upon the sum total of individual and group needs.³ The *curriculum*, on the other hand, signifies an effort to provide for the needs of differing individuals and differing classes. Here is to be found specialization of instruction for the benefit of the one or the few. The organization of such curricula is to be observed in the formulation of the so-called special courses—English, college preparatory, scientific, commercial, technical—in the modern cosmopolitan high school. The *course of study*, that is, the quantity, quality, and method of work,

¹ In the absence of a generally recognized and clearly defined terminology, it seems appropriate to recognize some distinction between the several terms applying to the organization of instruction. Those suggested by the Committee on College Entrance Requirements (*Report*, p. 42), in spite of certain limitations, will serve the present purpose. The *programme of studies* properly includes all the subjects offered in a given school. The *curriculum* refers to a group of subjects systematically arranged for any pupil or set of pupils. The *course of study* means the quantity, quality, and method of work in any given subject of instruction.

² This is only partly true. The school and all education are too much subject to tradition to be, at any particular time, immediately and directly responsible to the prevailing demands. Consequently, the content and processes of instruction always lag behind the social need and the individual requirement.

³ "In other words, in the determination of the course of study [*i. e.*, *programme of studies*], not the interests and activities of the individual, but the ideals, the requirements, the activities of society constitute the final standard." (MacVannel, *School Review*, vol. 14, 103.)

in any given subject of instruction, is the result of the experience of the school and of the teacher. Broadly speaking, the programme of studies is the means for realizing the wide social ideal; the curriculum, the means for arriving at class or individual ends; and the course of study, the means for attaining an immediate pedagogical object. Society as a whole determines the first; special groups, the second; and the school, the third.

The programme of studies, the curriculum, and the course of study represent the foundation material of the instructional work of the school. Each is, in varying amounts, subject to legislative, to administrative, to supervisory, and to inspectorial control. An outline answer to the question, who should determine the content, the operation, and the standards of worth of instruction will, it is believed, serve to delimit the field of action of each type of control.

The Making of Plans and Specifications of Instruction.

—The past has always laid a heavy hand on social institutions, especially the school, and more especially what the school has taught. This has been both good and bad for formal education; good in that experience has been a guide to trodden paths; bad, in that the experience of the past too frequently has not been able to see around the corner of the present. Albeit, modern school control must be conscious of the indisputable fact that the ideals and acquirements of preceding generations of school practice cannot be disregarded. The school follows the universal law of evolutionary development. Therefore, when one speaks of planning programmes of studies, the organization of curricula, or the making of courses of study, what one really means is that a conscious endeavor is being made to adapt the established

content, arrangement, and method of instruction to the new and changed conditions of the present. Effective control of school instruction must be Argus-eyed, and while it attends chiefly to the educational needs of the society of to-day and to-morrow, it may not neglect to hold in view the accomplishments of the society of yesterday.

If it has been impossible for the school to evade the power of the past, it has been difficult in the extreme to avoid an autocracy of the present. The whims, biases, and transitory enthusiasms of influential individuals, as well as the established interests of special social groups,¹ seek to impress themselves upon what and how the school teaches. The real wisdom of school control consists in an ability to detect and absorb the elements of real progress and to disregard the counterfeit and the make-believe.

It may appropriately be asked at this point, as a matter of great practical importance, what special responsibility does each one of the described forms of school control have with regard to the general plans and schemes of instruction to be followed in a school or class of schools? The circumstances of presentation compel brevity of reply. Beyond question, the proper fixing of the kind, amount, and order of arrangement of the instruction are matters requiring expert knowledge. They are matters that should be determined in accordance with defined social and scientific principles, the meaning and operation of which can be comprehended only after that period of special study, training, and experience, through which only scientific specialists and technicians pass. Consequently, they should not be subject to the direct influence of either legislative or administrative control. They

¹ The recognized power of the commercial classes over modern schools of all grades aptly illustrates this portion of the argument.

belong strictly to the province of the supervisor and the inspector.

To specify more in detail: Only in so far as a general social policy is concerned may the legislative authority be exercised within the field of secondary or higher instruction.¹ It may describe the ideal and ends to be attained; it may frame the general policy of operation; it may prescribe the functions of specific institutions; it may grant to administrative and supervisory agents permissive authorization to require the teaching of certain subjects. To go beyond these limits means encroachment and interference with the legitimate scientific direction of instruction, which, it may again be emphasized, depends upon the free exercise of the skill and insight of the expert.

A problem far more difficult of practical solution is presented by the relation of administrative boards and agents to the organization and control of instruction. This problem is a conspicuous one with the public high schools. Any satisfactory or complete discussion of the proper functions of boards of education (and all boards and general administrative officers controlling fiduciary and other non-public institutions) is entirely beyond the scope of this brief discussion. It seems essential, however, to express the general conclusion that, in respect to instruction, such boards should confine themselves to providing support and material means and, above all, com-

¹ Paradoxical though it may seem, the prescription of instruction in public elementary schools by legislatures may be defended on the ground of the social issues involved. While in the United States it had been customary to define by law the subjects of instruction for public elementary schools, the causes and reasons for such legislative control do not hold in the more complicated and differentiated fields of public secondary and higher education.

petent supervisory and instructional experts. They may, and perhaps should, as a matter of social policy, *approve* recommended programmes of study. The details of these programmes, the organization of curricula, and the fixing of the content of courses of study belong elsewhere. Ideally, the ultimate control of the general plan and working details of instruction should rest primarily with the supervisory authorities: guided by the general social policy formulated by the legislative and administrative authorities, with due regard to the capacity of these authorities to provide ways and means, and acting in co-operation with the principal agents of instruction, the teachers.¹

Inspectorial Control of Instruction.—It is pertinent to include at this time some consideration of the inspectorial control of instruction, which has developed from two principal sources—the organized State school systems, and the higher educational institutions, college and university. Each serves to standardize the intellectual organization of secondary schools and thus to influence in a marked manner the purpose and content of programmes, curricula, and courses of study.

During the past two decades the public high school

¹ "As long as the teacher, who is, after all, the only real educator in the school system, has no definite and authoritative position in shaping the course of study, it is likely to remain an external thing to be externally applied to the child." (Dewey, "The Educational Situation," p. 30.)

As a matter of fact, this desirable relation of the teacher to instructional plans so effectively set forth by Professor Dewey is, in the great majority of cases, most difficult of attainment. So long as secondary school-teachers, as a class, live such a short life of professional activity, and are trained only to the point of being able to reach a scanty minimum of instructional or educational efficiency, the chief dependence for the efficient direction of teaching must be upon the supervisory and inspectorial authorities.

has undergone a rapid expansion and development. More and more it has tended to become the most important institution of popular education. This situation has caused the State to employ various means for raising the efficiency of the high school, chiefly by the provision of special financial aids and the establishment of certain more or less uniform standards of instruction to be met as a condition for the award of the State support. Systematic State inspection of public high schools by agents of the State has been a natural outcome, and contemporary events would seem to indicate a yet more extended oversight of public high school instruction by the State. That this will be justified, there can be no debate; provided, however, that this oversight is exercised through skilled agents, competent to evaluate the meaning and results of instruction, and in such a manner as to leave to the supervisory authority of each school its freedom of action and rightful responsibilities. Effective, constructive supervision, it may be repeated, results from personal contact of the supervisor and supervised. The State should inspect, but not supervise instruction. And this responsibility of inspection should extend to all schools, public, private, and otherwise.

In theory, the State is seeking more effectively to realize the public purpose of secondary education by setting up standards of value. The college and the university have, at the same time, striven to secure from the secondary school that quality and quantity of instruction which might serve as a foundation for their own work. Originally the higher educational institutions did not much concern themselves with the instruction given in the high and other preparatory schools. Students applying for admission were tested by formal, written examinations.

With the establishment and development of the State colleges and universities this method was gradually replaced by that of admitting upon the certificate from the secondary school. Such a plan presumes that certain prescribed entrance requirements have been fulfilled, and in consequence the college and university have begun to exert a large and, in many respects, an ill-proportioned influence upon the kind and amount of instruction in the high school. From the inspectorial relationship which the higher institution assumed toward the lower has developed one of the most complex issues in modern education. It is not intended to present in any detailed way the problems that have arisen. We may not dismiss the subject without expressing the judgment, which might be supported by ample evidence, that this inspectorial relationship should not carry with it the power and authority to interfere with the legitimate activities of the supervisory authority of any school. The State and higher education are primarily interested in the product of instruction. The means and processes for producing this product are matters that should be within the determination of those in immediate supervisory charge of instruction.

Internal Control.—Up to this point the presentation has been confined to those factors of influence that operate externally; that is, they impress themselves on the school from the outside. It is now desirable to consider the principal internal forces that make for the efficient organization and control of instruction.

Principals and Superintendents.—As a consistent conclusion to the argument already set forth, the first and foremost requirement for the realization of the aim of any school is that it be under skilful direction and control. This is to say, that the individuals filling the office

of principal, head-master, superintendent, or by whatever name the supervisorship is known, are to be personally, professionally, and in every other way fitted to act as directors of a real educational process. It is far from sufficient that they be administrators and executives or inspectors of high grade, however necessary and valuable the proper performance of the activities implied by those words may be. As a rule, American schools are well provided in these directions. The capacity to lead without compelling, to inspire without futile resort to wordy sentiment, to produce a unity of aim from diversity of effort, to measure results scientifically and humanely, and to spell the responsibility of self and co-workers to pupils with a capital R—these are the demands of the supervisor, especially of secondary instruction. Minus these, the machinery of organization moves without progress, and programmes, curricula, and courses have a depreciated value. The competent supervisor then represents the first condition for the vitality and worth of instruction. Legislator and administrator perform their chief direct duties toward instruction by providing for the supervisor.

Teachers.—But leadership must needs have followers, and control must issue from intelligent co-operation. The lever of instruction rests upon the qualified class teachers who constitute the fulcrum of educational efficiency. And by *qualified* is meant individuals who have been selected, educated, and trained for specific instructional duties. A frank, unbiased view of the existing situation must be convincing that, speaking by and large, the secondary schools of America, non-public as well as public, are not accomplishing their tasks, chiefly because of the lack of educated and trained teachers. It has taken several decades to establish the general standard

that an education equal in quantity to four years beyond the high school is a not unreasonable one for high and other secondary school-teachers. It will probably take another decade or more to produce a wide realization that the college graduate is, *ipso facto*, not qualified to teach any subject in the expanded programme of studies, even though he is permitted, *ipso jure*, to attempt to do so. Whatever be the necessary personal attributes and the broad cultural foundations for successful and efficient teaching—and these qualities do not stand in need of emphasis—the class teacher, upon whom resultful instruction depends, must be a master of one or, better, two subjects of instruction; a master of those subjects, not according to the traditional standards of academic scholarship, but according to the standards erected for secondary education. These latter standards necessitate a mastery of the intellectual and moral processes of children as well as the mastery of the forms of knowledge. The central responsibility for this mastery rests with the institutions charged with the preparation of teachers for secondary schools.

Selection of Teachers.—While the preparation of a sufficient supply of properly qualified teachers is as yet an unsolved problem with us in America, there is another closely related one which is of even greater importance to the school. Expert and competent supervision, if it be worthy of its name, must include the right to select the teachers who are to carry out the plan of instruction. Here, at least in so far as public schools are concerned, and in particular the public schools of small communities, the practice of lay administrative boards in assuming to select and to determine the fitness of teachers constitutes an obstacle of no mean proportions to progressive stand-

ards of instruction. The selection of teachers is not only one of the rights, but also one of the inherent responsibilities of the supervisor. Without this right and this responsibility the holder of the supervisorship degenerates into the position of performing, mechanically, administrative duties connected with instruction. The class teacher personally fit, liberally educated, technically trained, professionally selected and retained according to defined standards of teaching efficiency represents the second condition whereby the plans of instruction take on reality.

Material Equipment.—To adept supervision and proficient teaching must be added as a third condition the provision of appropriate accommodations and necessary equipment. The need of buildings, convenient and adapted for their special educational uses, and of books and apparatus, is too evident to justify any discussion. This need has become greater with the rapid growth of attendance upon the schools under consideration. Nevertheless, the number of these schools which are housed and equipped in ways that enable the most fruitful teaching is relatively small; regretfully small, when the gross expenditures for these items are recalled. Calculation of the realizable worth of any course of study must take into account the objective facilities at hand in the form of libraries, laboratories, and illustrative material of every sort. Efficient administration will furnish these aids to teaching; efficient supervision and teaching will convince those responsible for the material welfare of the school that there is an intimate relation between these means and the desired ends of instruction.

Text-Books.—The text-book maintains a place of first importance among the necessary equipment for instruc-

tion. Even with its limitations as an instrument for teaching, and admitting the altogether too prevalent tendency of both teachers and learners to magnify its value, the agencies for the supervision and direction of the instructional work of the school must reckon with it. Here again the expert control of the school finds itself restricted and handicapped by other predominating forces. The selection of text-books, next to the selection of teachers, is a responsibility that belongs within, and not without, the school. Under existing conditions officers of administration and representatives of commercial interests exercise too potent an influence, an influence which is not always regardful of the requirements of instruction and education. Under a proper plan of organization, the supervisory authority, acting in close co-operation with the teacher, should determine finally the question of text-books. Violation of this essential working principle is a needless interference with the legitimate functions of those from whom society expects a service founded on skill and technical knowledge of the educational processes.

In all probability the school will best succeed in attaining its instructional ends by providing for its pupils the needful text-books. The free text-book for public elementary schools has proved its advantages. The arguments that hold with this class of schools are equally, and perhaps even more, valid in the case of secondary schools.

Instruction in Operation.—From now on the questions before us involve the triangular relations of supervisor, teacher, and pupil. The more important of these may be dwelt upon only briefly.

Supervisory Control.—The activities of control that are rightfully supervisory in character have been already described as involving expert skill in applying technical

knowledge of the means and methods of education; as involving a personal, co-operative contact between the supervisor and the teacher; as resulting in constructive progress. While effective supervision comprehends these aims and results, in actual practice it includes also the measuring function of the inspector. Stating the matter in another way, purposeful supervisory control necessitates clear-cut standards for determining the relative worth of the various means and methods which the school employs to produce its products; and also the relative worth of the products.

The first test of direct supervisory power comes with the assignment of the teacher's instructional work. Given teachers of the requisite special preparation and general fitness, it is yet necessary to bring about the adaptations to the variable circumstances under which instruction within the school must be conducted. As a general practice the secondary school requires of each individual teacher too great an amount of teaching. Five periods of fifty minutes each per day—which means twenty-five periods of instruction for the week—may be regarded as a maximum assignment. In certain subjects, as, for instance, those in science, requiring for their proper treatment much preliminary detail; or English, demanding a rigorous scrutiny of written work, a limit of four daily periods of teaching should be established in the interest of the best results. At any rate, every assignment will consider all of the factors that exert a positive or negative influence upon the working capacity of teacher and pupils. The widely prevailing practice of considering a class as a standard, uniform thing in assigning work to teachers is not wholly consistent with wisely directed control. Differences in quality of courses of study, the size and

possible rate of progress of classes must be constantly held in mind.

A second test of the worth of the supervisory control is to be found in the ability of the supervisor to serve as an inspector and to distinguish teaching that is prolific in results from that which is barren; theoretically, a simple thing; in reality, a most complicated and difficult accomplishment. The more common types of profitless instruction are generally known, as well as those having real worth. These types do not ordinarily present grave problems. The real problems are to be found in the great amount of teaching that is neither good nor bad. To detect without delay teaching of this sort and to analyze it into its constituent elements characterize the trained inspector; to be able to eliminate from these elements those that are useless or harmless and to cultivate and develop those that are really serviceable distinguishes the constructive supervisor. The latter tasks are the more needful for the efficiency of instruction and consequently the least frequently attended to. In the stage of development in which modern organized education of every grade finds itself, the supreme business of the supervisor is to transform average, or less than average, teaching performance into something that has a much larger positive worth. To accomplish this great end the instruction of each class and of each course of study will be constantly guided in its conduct; guided but not blindly restrained.¹ Furthermore, justice requires the intimate acquaintance with the work of each teacher that comes from regular, systematic

¹ The preparation of weekly outlines and plans of work, and the periodic submission of reports of progress of classes by teachers, are regulative devices of worth when properly handled. There is always the danger, however, that they will come to be regarded as ends in themselves.

and intensive visitation by the supervisor. Constructive criticism is individual. It cannot be generalized and effectively applied by treating the teachers of a school *en masse*. Teachers' meetings, save for the discussion and formulation of general policies, are neither economic nor effective means for increasing individual teaching power.

The organization and operation of instruction through programmes, curricula, and courses of study has as a fundamental and, indeed, an only purpose the creation of influences that will result in those changes in the capacity and conduct of individuals which we call education. The immediate subject of attention of the supervisor is the teacher, for directly through the teacher these changes are produced. The ultimate purpose of all school control is, however, to secure to the pupil those conditions most favorable to the production of those changes desirable to him as an individual and needful for the welfare of society. The pupil is the centre of gravity of the educational system, and all the forces of instruction should be aligned to this centre.

The relationship of the supervisor to the class teacher has been described as including as essential elements the selection of qualified teachers, the economical and effective assignment of work, and the measurement of results. The relation of the supervisor and the class teacher to the pupil is composed of these same essential elements.

Preparation of the Pupil.—The timely and complete fruition of instruction in the secondary school is in the largest measure dependent upon the capacity and elementary preparation of the pupils for this instruction. Whatever be the cause, the absence of a thorough elementary foundation of its entering pupils constitutes a

very real problem of the American high school. It must be remembered that this school is not an independent educational organization; it is an integral unit of a larger whole. To the large demands now placed upon it should not be added that of supplying the elementary foundation. The desire for regular progress through the elementary schools, amounting almost to a passion with the public, the teachers, and the pupils¹ has, without question, lowered the standard of necessary qualifications for admission to the secondary school. The noticeable tendency of the present day to increase the amount of elementary instruction in public and non-public secondary schools is significant evidence upon this point.

To establish standards that really measure the fitness of pupils for the pursuit of secondary courses of study is as yet one of the unperformed tasks of modern school control. Such standards should include not only those of an intellectual character, but also those taking into account ambitions and potential capacities of individuals. These are social assets which the schools dare not waste.

Curricula and Courses of Study.—The assignment of work for pupils, either as groups or as individuals, necessitates the making of curricula and courses of study. The insight of the supervisor and the skill of the teacher come to their consummation in the adaptation of the instruction to the real and vital needs of the individual. Details may not be elaborated here, but as a general proposition it may be said that the justification of secondary education as a part of a broad social policy will be found in the

¹ "Sometimes I wonder how many pupils, upon an honest grading, with a course of study intelligently prepared, would actually reach the grade next below the high school, for I know that many are 'pushed up.'" (Chancellor, "Class Teaching and Management," p. 208.)

degree to which the instruction in secondary schools functions in the conduct and lives of those receiving it. The day of merely formal intellectual attainment is past, at least within the realm of popularly supported education. Curricula and courses of study find their real basis in the demands that life makes upon individuals.¹ To analyze these demands and to take stock of the individual are requirements which cannot be evaded if instruction is what instruction claims to be.

One especially important aspect of this problem will need to be considered by the school control of the immediate future. This is the differentiation of the content and method of instruction of boys from those of girls. The old democratic ideal of educational equality that has resulted in the practical identity of the secondary instruction of boys and girls must sooner or later give way to the new democratic ideal that distinguishes *identity* and *equality* of instruction. The proper winnowing of the younger generation for life's serious purposes will be accomplished only by giving to boys instruction intended for boys, and to girls instruction designed for girls.

Tests of Attainment.—As a final element of the relation of school control and instruction to pupils, that of devis-

¹ "With the rounding out of the high school to meet all the needs of life, the standard changes. It ceases to be these vague abstractions. We get, relatively speaking, a scientific problem—that is, a problem with definite data and definite methods of attack. We are no longer concerned with the abstract appraisal of studies by the measuring-rod of culture or discipline. Our problem is rather to study the typical necessities of social life and the actual nature of the individual in his specific needs and capacities. Our task is, on one hand, to select and adjust the studies with reference to the nature of the individual thus discovered; and on the other hand, to order and group them so that they shall most definitely and systematically represent the chief lines of social endeavor and social achievement." (Dewey, "The Educational Situation as Concerns Secondary Education," p. 79.)

ing reliable measures of attainment and progress represents a problem of prime importance. The common measures of the efficiency of teachers are in reality estimates of the worth of *causes* that are presupposed to contribute to the product of teaching. Personality, intellectual attainment, moral vigor are illustrations of the terms used when making such estimates. There is need, though, to find some measures of the *results* of teaching. Percentages and marks are rough attempts at this kind of measurement. They are inadequate and unreliable as real tests of the effectiveness of instruction. The school assumes through itself and its instruction to develop so-called "powers." Some measure of these powers is yet to be contrived before we shall know what is the real worth of teaching. The *moral* as well as the *intellectual* acquirements of the instructional process are tangible objects measurably worthy of the attention of a scientific control of instruction; are necessary for such control.

CHAPTER VI

MATHEMATICS

L. C. KARPINSKI, PH. D.

ASSISTANT PROFESSOR OF MATHEMATICS, UNIVERSITY OF MICHIGAN

"No single instrument of youthful education has such mighty power, both as regards domestic economy and politics, and in the arts, as the study of arithmetic. Above all, arithmetic stirs up him who is by nature sleepy and dull, and makes him quick to learn, retentive, shrewd." (Plato, "Laws," 5:74.)

Place of Mathematics.—Mathematics has always held an honorable place in instruction. If other subjects are to supersede it they must first demonstrate their superiority for preparing the youth for the world's work. As yet, indeed, no other well-articulated branches of instruction, comparable to the possible progressive sequence in mathematics, can be offered in the curriculum, as in no other subject has the work been so well and so completely formulated. In American schools mathematics holds the commanding position of the required subject, covering a period of years extending through the primary and secondary grades, and demanding continued application along one line of reasoning. This is more true of American than of European schools, as in European school systems the work in Latin plays much the same rôle. The purpose in this paper is to show that mathematics still has a valid claim to the place accorded it in education.

Mathematics Among the Ancients.—The Greek recognition of mathematics is best attested by the long line of

philosophers who were mathematicians and of mathematicians who were philosophers. Aside from purely literary and philosophical works, our knowledge of ancient Greek thought is gained largely from the record of their achievements in this field. To a somewhat less extent this holds for ancient peoples with whose civilization we are not so well acquainted. Hindu literature abounds in references to mathematical subjects and the closely related astronomical ones. So, too, the wise men of Egypt and Babylon and China, many centuries before the Christian era, occupied themselves with this science. Coming down through the ages to the Mohammedan period, we find that the Arabs began their intellectual activity by the study of the mathematics of Greece and India. These Arabic writers have powerfully influenced our modern courses in mathematics. While in elementary geometry the Greek influence is predominant (although the mensuration side is probably as much Egyptian and Roman as Greek), the algebra, arithmetic, and trigonometry carry us back to the Mohammedans, and especially to Al-Khowarizmi, whose name, in Latin transliteration *Algorismi*, gave rise to the word *algorism*, long used for arithmetic.

Medieval Mathematics.—Al-Khowarizmi lived in Bagdad early in the ninth century. His treatise on the Hindu art of reckoning with the nine digits and a zero to give place value was translated into Latin in the twelfth century and this was the work which introduced into Europe modern arithmetic with the ten symbols of India. An Englishman, John of Halifax (Sacrobosco), becoming acquainted with this translation, wrote an *Algorismus vulgaris* which was widely used in university instruction in arithmetic from 1250 to 1550. From Al-Khowarizmi

we have also an algebra, the first well-coördinated text-book on the subject which has come to us, although Diophantus (c. 250 A. D.) had covered much the same ground. The body of this Arabic algebra deals with the solution of quadratic equations including geometrical explanations of the forms: $ax^2+bx=n$, $ax^2+n=bx$, and $bx+n=ax^2$. The theory of irrationals is touched upon slightly, but negative numbers as such do not appear, which accounts for the three types of quadratic equations, as above. This algebra was translated in the twelfth century both by Robert of Chester and Gerhard of Cremona, and such translations long occupied a place in university instruction, even as did Al-Khowarizmi's arithmetic. In trigonometry his contributions were relatively less important and yet worthy of mention. The *De triangulis omnimodis libri quinque*, by Regiomontanus (1436-76), is the precursor of modern trigonometries although much of the science was developed in earliest times.

The period from the sixth century (A. D.) to the founding of the universities in the twelfth and thirteenth centuries was remarkably unproductive and unprogressive. The mathematical work formed no exception. In arithmetic the instruction was mainly in formal definitions and the Greek *arithmetica*, corresponding roughly to the elements of modern number theory, and excluding practical computation. However, in the tenth century the abacus began to be used, and from this time on treatises explaining its operation are fairly common. Typical text-books of these centuries are represented by the extremely sterile arithmetic and geometry of Boethius (c. 480-524). His geometry contains only a fractional part of the first four books of Euclid without proofs, but with some additional mensuration.

European Countries.—With the rise of the universities the geometry of Euclid and the Hindu art of reckoning became regular studies of the curriculum. In the first half of the sixteenth century the M.A. degree in England presupposed a knowledge of the first six books of Euclid. In arithmetic the fundamental operations with integers, square root, cube root, fractions, and progressions occupied the attention of students. Algebra had no place even in German universities until late in the fifteenth century. Geometry was not generally introduced into the secondary schools of Germany until late in the seventeenth century, while ordinary arithmetic preceded it by a century. Other European states lagged behind Germany. England and France did not add geometry to the secondary programme until the eighteenth century, while algebra in the schools is largely an innovation of the nineteenth.

United States.—In the United States common public secondary schools are less than one hundred years old. How recent is the general instruction in algebra is shown also by the fact that Harvard, in 1841, first required algebra through quadratics for entrance, and geometry not until 1844. The subjects themselves enjoy a respectable antiquity, but their appearance in secondary schools is so recent that we may with more boldness suggest changes in the method of treatment.

This brief sketch of the history of the elementary branches as school material indicates one of the reasons for continuing the subjects in the school programme. Wars, political divisions, and other largely external facts of the lives of ancient peoples are deemed worthy of study. How much more so then mathematics, which not only has contributed to scientific advancement, but has also played

so large a part in the intellectual development of the world.

Practical Bearing of Subject.—The practical side of mathematics has frequently been over-emphasized in popular discussions of its function. Serious effort has been made recently to find problems suitable for secondary work which touch vitally the lives of the pupils or their parents. How varied are the applications of mathematical reasoning is shown by the fact that such problems are taken from manual-training work, physics, engineering, architecture, masonry, navigation, agriculture, forestry, drawing, astronomy, designing, athletics, pattern-making, economics, and carpentry. And yet, were we to confine the instruction in arithmetic, geometry, algebra, and trigonometry to those phases which enjoy a reasonable measure of actual application the time devoted to these subjects could be cut in half. Mathematical instruction must justify itself as educational material aside from its applied values.

Varied Appeal of Subject.—While the universality of the language of mathematics suggests the common brotherhood of man, the contact with truth, absolute and eternal, lifts the mind out of its ordinary channels into contemplation of the eternal of the universe. The beautiful and sublime in mathematics are as difficult to define as in music or in art, and just as real. One aspect of the beauty is the symmetry even in such simple expressions as $(a+b)^2 = a^2 + 2ab + b^2$, $(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$. Harmony in the universe of mathematics is exhibited by the relations between arithmetical and geometrical facts; while another aspect of beauty is obtained when these expressions are grasped as single facts of the expansion of $(a+b)^n$. The reign of law apparent here is satisfying to

the reason. That mathematics makes this general appeal to the human mind is clear from our historical sketch and is even as true to-day as it was in the time of the Greeks.

The game element is not to be despised nor is the unique stimulus gained from the successful solution of puzzling problems. Both contribute to give the student a longing for exploration in fresh fields as well as a sense of mental independence not developed by any other school discipline. Further, the desire for truth for its own sake is worth cultivating as entirely apart from any applications. A knowledge of the elementary truths of arithmetic, geometry, and trigonometry may also be considered as a necessary beginning to any comprehension of the scheme of the universe.

Training and efficiency come from continued application along one line of progressive activity. Education and culture are by-products of training along several lines. More than any other practically available subject, the sciences under discussion furnish a body of consistent sequential material sufficient to occupy the attention of the child for a period of years. Equally important is the fact that like the mother-tongue the language of mathematics is employed in the daily life of the child; to formulate this in the language of the psychologist there is a related body of apperceptive material already present in the child consciousness. He has an active and fairly continuous interest in number and form, furnishing ample material to build upon.

The reasons for teaching algebra, geometry, and trigonometry need not be discussed separately, as the one distinctive characteristic which makes these subjects available for secondary work is just this fact that they are closely and logically related. Our schools have happily

discarded fine distinctions between algebra and arithmetic, and algebraic symbolism is introduced as soon as the child feels the need for it. A most necessary reform is to bring about a somewhat similar fusion of the ideas of algebra, geometry, and trigonometry.

Need for Mathematics.—The ultimate needs of society, and the present needs of the child must govern the selection of work in the high school as well as in the elementary school. How varied is the need of mathematical reasoning is shown by the numerous developments along mathematical lines in other fields, *e. g.*, biometrics, mathematical chemistry, and mathematical physics. Analytical and graphical treatment of statistics is employed by the economist, the philanthropist, the business expert, the actuary, and even the physician, with the most surprisingly valuable results; while symbolic language involving mathematical methods has become a part of well-nigh every large business. The handling of pig-iron does not seem to offer any opportunity for mathematical application. Yet graphical and analytical treatment of the data from long-continued experiments with this material at Bethlehem, Pennsylvania, resulted in the discovery of the law that fatigue varied in proportion to a certain relation between the load and the periods of rest. Practical application of this law increased the amount handled by each man from twelve and a half to forty-seven tons per day. Such a study would have been impossible without preliminary acquaintance with the simple invariable elements of mathematics.

Relation between Mathematics and Other Subjects.—The recent wide-spread movement to humanize and vitalize the work of the school has affected mathematical instruction the world over. This has culminated in the

International Commission to investigate the teaching of mathematics. Certain features of this comprehensive movement are making a wide appeal. Definite attempt is being made to bring the mathematical work into closer touch with other subjects of the school curriculum and with life. A comparison of modern school texts with older ones shows clearly, in the problems presented, the effect of this movement. Emphasis is also placed upon the necessity of adapting the work to the mental development of the learner. The real problems, for example, must have meaning for the pupil, must parallel his stage of psychic development.

The Graphical Method.—The universal aim of instruction is to make the child efficient in his actual work in the world. An essential to this end is the habit of functional thinking, the relating of one body of facts to a connected body of facts, and the drawing of sound inferences therefrom. Usually the graphical method is simplest, as, for example, the relation of temperature to time or crop statistics to time over a period of years. The interpretation of such functional relations is part of the business of secondary instruction. Any large comprehension of the one-to-one correspondence of one set of data with another must be first suggested by the graph. This method may be said to have achieved a positive recognition in secondary education. While much has been said in recent years about laboratory methods in mathematics, and while a closer correlation between physics and mathematics is desirable, yet any extensive laboratory exercises are foreign to the spirit of mathematical instruction. Since the data of mathematics are the products of thought, and thought alone, the applications also should be sought, not particularly in especially devised artificial exercises, but rather

in problems germane to the student's experience. The graph and the use of squared paper, which, in reality, constitute the major part of the "laboratory method," are now considered a part of the algebra work. Simple illustrations may be drawn from physics, *e. g.*, $s = vt + c$, emphasizing also the use of other letters than x , y , and z . Of other usable problems especially interesting are the graphical time-tables such as are used by railroads. Pupils will enjoy reporting other applications of graphical methods from trade journals, from the *Scientific American*, and even from popular magazines. It is clear that the use of the graph carries with it the employment of approximations which should be emphasized not only here but in all of mathematical teaching.

Wise Distribution of Time Needed.—Fortunately, our most pressing need is not that more time be devoted to mathematics but rather that the time accorded be more wisely distributed. The problem of this distribution affects the elementary schools as much as the secondary. The connection with the six-year high-school course, preceded by six years of elementary schools, is intimate. Many schools are giving instruction in concrete geometry and algebra in the seventh and eighth grades. More effective work is being accomplished, in general, when this readjustment is accompanied by the departmental system of instruction, because, of course, better mathematical training for teachers is thus assured. The work in concrete geometry, mensuration, and mechanical drawing in the schools should be related closely and articulately with demonstrational geometry, *e. g.*, the construction of triangles with certain parts given should be directly connected with the corresponding theorems of demonstrational geometry.

Correlation between Algebra and Geometry.—In the high school itself closer correlation is needed between the algebra and the geometry. Five years of mathematics will be written on six-year secondary-school programmes, instead of two years of arithmetic, one year of elementary algebra, one-half year of advanced algebra, one year of plane geometry, and one-half year of solid geometry. German, French, and English secondary schools have long followed a somewhat similar scheme, demonstrational geometry and algebra running through six successive years. Recent foreign reforms emphasize the need of even closer correlation. The consequent extended familiarity with these sciences gives a readier command of the terminology, and insures more adequate time for the absorption of new and speculative conceptions as they naturally arise. This intermingling and correlation of arithmetic, algebra, geometry, and trigonometry, possible with this procedure, provides a more natural course for developing mathematical and functional thinking.

We may illustrate by the mathematical treatment of $(a + b)^2$ and $(a - b)^2$, with associated ideas.

Multiply $3 + 2$ by 3; by 2; by $3 + 2$.

Multiply $10 + 7$ by 10; by 7; by $10 + 7$.

Multiply $10 + 9$ by 19; $100 + 6$ by $100 + 6$; 15 by 15; 115 by

115.

Multiply $10 + x$ by 10; by x ; by $10 + x$.

Multiply $x + 3$ by x ; by 3; by $x + 3$.

Multiply $5 + 3x$ by $5 + 3x$.

The problems given are simply suggestive of the method and it is understood that there should be numerous other exercises with this form $(a + b)^2$ and with similar problems relating to $(a - b)^2$. This principle also finds application in the following work.

Geometric treatment of many problems of this sort should be given.

$$(10 + 3)^2 = 10^2 + 2 \cdot 10 \cdot 3 + 3^2. \quad (x + 5)^2 = x^2 + 2 \cdot 5 \cdot x + 5^2.$$

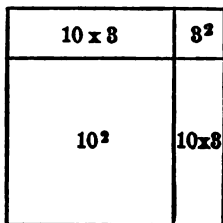


FIG. 1

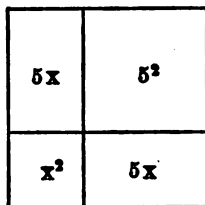


FIG. 2

This is preparatory also to a geometrical solution of quadratic equations in work as follows:

$x^2 + 10x = 39$. Begin with the small square of unknown side x as in Fig. 2. Extend two sides by the length 5, forming then two rectangles each of area $5x$. The total area is then $x^2 + 10x$, which by the conditions of the problem equals 39. Adding the small square, 25, gives 64. Therefore the side of the larger square is 8. Subtracting 5 gives 3 for the value of x .

A question naturally arises here in regard to a similar treatment of forms like $(10 + 3)^2$, $(x + 3)^2$, $(a + b)^2$. The possibility of geometrical representation should be suggested at first and developed more fully at a later time. We may continue with $(x + k)^2 = x^2 + 2kx + k^2$ and $(x - k)^2 = x^2 - 2kx + k^2$, as formulas with application to $(a + 2b)^2$, $(107)^2$, $(x + 3y)^2$, $(3x - y)^2$, $(96)^2$, etc.

The numerical applications relate to the former elementary multiplication of two-place numbers, and suggest the method of mental multiplication of any two two-place numbers.

The connection of the formula and the figure with the extraction of square root should be shown.

The Pythagorean proposition may be demonstrated with the above figure.

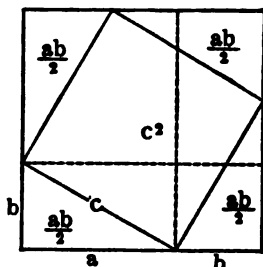


FIG. 3

$$(a + b)^2 = a^2 + 2ab + b^2.$$

$$c^2 = (a + b)^2 - \frac{4ab}{2} = a^2 + b^2.$$

Or again by the following figure and formulas:

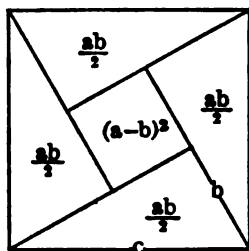


FIG. 4

$$(a - b)^2 = a^2 - 2ab + b^2. \quad c^2 = (a - b)^2 + \frac{4ab}{2} = a^2 + b^2.$$

$(a + b)^2$ is finally regarded as a special case of $(a + b)^n$.

Some of the above material belongs to the first year of a five or six year high school course in mathematics and

some to the fifth or sixth. It is intended to be suggestive and not for consecutive presentation, unless as a kind of summary in the last year. Lest it be supposed that the illustration given is unique in the range of its application, attention is called to the equations of the advanced algebra, $x^2-1=0$, $x^4-1=0$, $x^5-1=0$, which connect with the regular polygons of plane geometry and also with graphical representation of complex numbers. Similarly ratio and proportion are susceptible of analytical and geometrical treatment as well as practical application.

Future Changes in Teaching.—The changes that lie in store for the teaching of mathematics in the United States are without doubt along the lines indicated. The algebra work of the seventh and eighth years should first of all generalize the arithmetic that precedes and at the same time furnish effectual drill in formula substitution. The mensuration of simple surfaces and solids, the construction problems of drawing, and the concrete geometry in these years should be more closely related to demonstrational geometry, and this, in turn, to applied problems of decoration, of design, and to the trades. Algebra, geometry, and trigonometry should be more closely interwoven. Geometrical solutions of quadratic equations, geometric and algebraic treatment of ratio and proportion with application to the lever and other problems from physics, and the correspondence of theorems of plane geometry with theorems of trigonometry are further illustrations of possible correlation.

Oral Work.—Oral work has unfortunately been confined largely to arithmetic. In algebra and geometry many problems may be adapted to oral treatment. The fact is that clear exposition of the method to be employed

in solving ten simple geometric exercises, without setting the pencil to paper, is worth much more than the same time devoted to a single difficult exercise. Not only this, but the fundamental principles are more clearly exemplified in the less difficult examples. Simultaneous black-board work for the whole class, on the contrary, has occupied too much teaching time in algebra and geometry. A relatively greater proportion of time should be given to written seat work and oral work. These best prepare for the actual problems of life, which are both oral and written.

Need for More Simple Work.—Again the exclusion of topics is quite as significant as the suggested innovation of method of treatment. In elementary algebra complicated factoring, complicated complex fractions, highest common factor and lowest common multiple by the method of continued division, indeterminate equations, and inequalities and exceptional cases of simultaneous quadratics are representative of topics which are pedagogically under the ban. The time gained is to be devoted to an increased number of simpler problems and to those which can be treated orally. In plane and solid geometry, maxima and minima and the subject of formal treatment of incommensurable cases and of symmetry, all but the elementary principles, are excluded, together with the most difficult exercises. The tendency is to cut down the number of formal propositions to a minimum. Exercises suitable for oral practice accompany all the theorems and are combined with many of the simple problems for written solution. So-called "originals" are thus effectually regarded as vital parts of each day's work. The pupils learn to solve by solving. In trigonometry De Moivre's theorem and limits and series are relegated

to more advanced courses in college, while complicated exercises in trigonometric transformation give way to abundant and essential drill with simpler operations.

Need for Professionally Trained Teachers.—Probably the greatest obstacle to pedagogical advance in school mathematics has been the lack of adequately prepared teachers. Too often in our high schools teachers have been given a class in algebra or geometry simply to fill in the planned schedule. Unified and correlated work in mathematics throughout a period of years requires well-prepared instructors. While the American situation is improving in this regard, we yet fall below the standards of European countries. The examination required for a license to teach in a German gymnasium is quite as severe as that for the Ph.D. degree. Mathematical methodology indicates sufficiently that the remedy for our situation is a more comprehensive conception of the function of this subject and more intensive preparation on the part of the teachers in subject-matter.

College graduation may now be assumed as the minimum requisite in the professional equipment of secondary school teachers. As essentials for the future teacher of mathematics should be placed courses in advanced algebra, analytic geometry, projective geometry, the calculus, and one course in physics and an elementary course in astronomy. The history of mathematics should also, when possible, have a place in this preparation of the teacher, as it enhances the human interest in the subject. More difficult to obtain and yet fully as needful is *instruction in method of teaching mathematics hand in hand with observation and practice teaching under competent guidance and personal direction*. Normal schools have insisted for some fifty years on such work in the

preparation of elementary teachers. Even more necessary is this actual preliminary experience in school-room environment for college students as they are further removed from their school-days. The recognition of the need for observation and practice teaching, as well as definite instruction in methods of teaching mathematics for those preparing to teach in our secondary schools, cannot be long deferred. Indeed, the organization of schools of education in so many of our large universities heralds the near approach of the day when our high school teachers will have, not only the wider preparation in subject-matter so absolutely essential for a larger outlook, but also some definite scientific preparation for the delicate operations and the essentially psychological insight required in mathematical teaching.

A formulation of requirements in mathematics is made by a committee of the American Mathematical Society in co-operation with committees of the National Education Association. This programme has been adopted by the New York State Education Department (1910), the College Entrance Examination Board, and other organizations.

Elementary Algebra.—The four fundamental operations for rational algebraic expressions.

Factoring, determination of highest common factor and lowest common multiple by factoring.

Fractions, including complex fractions, and ratio and proportion.

Linear equations, both numerical and literal, containing one or more unknown quantities.

Problems depending upon linear equations.

Radicals, including the extraction of the square root of polynomials and of numbers.

Exponents, including the fractional and negative.

Quadratic equations, both numerical and literal.

Simple cases of equations with one or more unknown quantities, that can be solved by the methods of linear or quadratic equations.

Problems depending upon quadratic equations.

The binomial theorem for positive integral exponents.

The formulas for the n th term and the sum of the terms of arithmetical and geometric progressions, with applications.

It is assumed that pupils will be required throughout the course to solve numerous problems which involve putting questions into equations. Some of these problems should be chosen from mensuration, from physics, and from commercial life. The use of graphical methods and illustrations, particularly in connection with the solution of equations, is also expected.

Advanced Algebra.—Permutations and combinations, limited to simple cases. Complex numbers, with graphical representation of sums and differences.

Determinants, chiefly of the second, third, and fourth orders, including the use of minors and the solution of linear equations.

Numerical equations of higher degree, and so much of the theory of equations, with graphical methods, as is necessary for their treatment, including Descartes' rule of signs and Horner's method, but not Sturm's functions or multiple roots.

Plane Geometry.—The usual theorems and constructions of good text-books, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle.

The solution of numerous original exercises, including loci problems.

Applications to the mensuration of lines and plane surfaces.

Solid Geometry.—The usual theorems and constructions of good text-books, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders, and cones; the sphere and the spherical triangle.

The solution of numerous original exercises, including loci problems.

Applications to the mensuration of surfaces and solids.

Trigonometry.—Definitions and relations of the six trigonometric functions as ratios; circular measurement of angles.

Proofs of principal formulas, in particular for the sine, cosine, and tangent of the sum and the difference of two angles, the product expressions for the sum or the difference of two sines or of two cosines, etc.; the transformation of trigonometric expressions by means of these formulas.

Solution of trigonometric equations of a simple character.

Theory and use of logarithms (without the introduction of work involving infinite series).

The solution of right and oblique triangles and practical applications, including the solution of right spherical triangles.

Plane Trigonometry.—This subject is the same as the preceding except that no topics from spherical trigonometry are included.

CHAPTER VII

PHYSICS

FREDERICK EDWARD KESTER, PH.D.

HEAD OF DEPARTMENT OF PHYSICS, UNIVERSITY OF KANSAS

Elements of Interest to Student.—Before the subject-matter of modern physics had become so specialized as to take its place as one of the natural sciences, the “philosophers” of this “calling” were accustomed to go far afield in their search for material. It would be difficult to decide, in an attempt to understand the motives which urged them ahead in the search, whether these were more nearly akin to the motives of the hunter or to those of the explorer. That both incentives are present, and that both serve this end, are fairly evident; both the elation in the contemplation of new lands, of new and broader views, and the glow of the hunter with the game at his feet are the just dues of the follower of nature’s truths. The motive force of the student of modern specialized science, no less than that of the earlier “natural philosopher,” has in it a large element of the *Wissensdrang* of the explorer, and the other element of the excitement of the chase.

Running beside these two elements, always in close co-operation with them, is another line of activity, with its effects far more noticeable in our modern sciences than in their predecessors, namely the correlation of the landmarks already discovered and studied—the general-

ization of our gathered material into laws and principles of science. In no other field of intellectual work is this process better exemplified than in physics. So well developed are the fundamental laws of this science and so solidly founded its important theories, that even the long reaches into new lands which have been made within the last two decades, and the strange and wonderful phenomena brought back from the new territory, have served more to strengthen and to unify these theories than to disconcert them.

It is the generalizing method of physics which Mach, in his "Mechanics," praises so highly for the principle of economy inherent in it. As he makes so clear, it is the economy of representing in mental picture an actual experience which gives science its main justification for existence; it saves us the time and trouble of re-experiencing on every occasion a phenomenon of nature, by representing the experience to our minds in terms of a general law. We see, from this point of view, an explanation of the trend of which the subject-matter of modern science is indicative. As an instance, we find an explanation of the existence of the wonderfully simple laws of refraction of light which express all of the exceedingly complex and beautiful phenomena attendant upon the passage of light from one medium to another. We have, as well, an explanation of the existence of a theory which shall expound the real significance of the laws of refraction—explanation for the hard struggle, even, by which this wave theory of light was gradually brought out of the mere haze of faltering hypothesis into its present firmly established position. Such explanation acts as a powerful sustainer and guide for the interest and enthusiasm of a student of science; for this reason alone the

reading of the section on the "Economy of Science," in Mach, would be worth as much as the command of one of the broad and masterful generalizations of the science.

The Seven Ultimate Concepts.—As we follow, in the study of physics, the play of forces, now on masses, now on quantities of electricity, producing sometimes merely strains, at other times motions, and as we follow the streaming of energy, here as light, there as electromagnetic waves, again as convection currents carrying heat in their paths, we meet repeatedly the "ultimate concepts" of space and time, mass and inertia, electricity and ether, and of energy as the result of the interactions of the others. Still other concepts than these seven we encounter along the way, but they lead us on, in each case, to one or more of the "ultimate concepts"¹ just enumerated.

Strange to say, the remarkable growth of physics during the last two decades did not necessitate the introduction of any new concept into this group of seven; indeed the new phenomena, which have been brought into the science since Roentgen's discovery of the radiations now bearing his name, have served to draw the former group into closer relationship, and if any change occurs in their number as a result of this development it would seem, more probably, to be the incorporation of two or three of them into one. After the spirit of physics had brought, during the past century, the older concepts of magnetism and of frictional electricity and the newer one of current electricity into their present relationship, and had proved that the phenomena of radiant heat and light belong to

¹ See Nichols, E. F., on "Physics," *Popular Science Monthly*, 72, 323; 1908.

the same family, its next great move was to prove an intimate kinship between electricity and matter.

Seen from this point of view, physics presents an admirably well organized front to the observer. That so great a part of the many and multiform physical happenings of our every-day life, whether they occur within doors or in the open, whether in the city or in the field, should be reducible in their interpretations to so few terms, is truly incitement to wonder and admiration. It is a point of view to which we should return again and again with our classes when we tire of the detailed consideration of the laws of the science.

What Physics Has Accomplished.—Not to the “inner organization” alone of physics are we limited in our admiration; its accomplishments, for our comforts, our necessities, and for our health, are even marvellous. We have been accustomed for years to the praises of our telephones, our telegraphs, our steam-engines, until now the tendency is to take these and innumerable other developments as matters of course. Of late years, however, we have been amazed again by the throbbing of wireless electric signals across an ocean, using the physicist’s ether as a medium and the ocean’s waves as a guiding surface—we have been amazed to see the structure of the atom taking form under the searching gaze of the electron theory. Now all of these things, old and new, are the children of the science of physics, children brought to full stature by the dauntless courage and energy of men who saw visions of their usefulness to the human race.

Moral Value of Physics.—Nor is the purely practical advantage, of which we hear so much in these days, obtained from knowledge of physical laws and principles through the better control of the physical phenomena

surrounding us in every-day life—through applications to engineering and to the industries—the only one worthy of notice. In common with all sciences the training in physics has a moral value. It emphasizes the fact that truth only counts toward the building up of science; that falsehood is not only valueless in this regard, but positively harmful, since it requires frequently the expenditure of more energy to kill it than was used to put it into existence, so that there is the double waste of effort which, properly used at the start, would have brought us far along in the pursuit. There is also, I believe, a development of conscience to be got from the careful statement of exact laws, to be got as well from the careful manipulation of apparatus in our laboratories. It is, indeed, difficult to see how a student, if he has entered at all into the spirit of this science, can come away from the study of it without an increased appreciation of downright honesty.

Status of Physics in High Schools.—Whatever may be the judgment of others concerning these last claims, all firm believers in the general educational qualifications of physics will rejoice in the gradual change which has come about in the status of the subject in the high school curriculum; for the increase in the amount of time allotted to the subject, and the fairly general recognition and adoption of the advantages of laboratory training, these, with the marked improvement in the scientific atmosphere emanating from the available text-books, must all serve to increase the effectiveness of the science for that great group of citizens who come out from our high schools.

Character of Early Instruction.—Under the name natural philosophy something approximating the present

subject-matter of physics was taught in the secondary schools of America as early as the middle of the past century. We have available fairly definite evidence of the character of the work done thus early, from an examination of the text-books which have been handed down to us from that period. Though the subject-matter of these text-books differs not greatly, in the topics discussed, from that of more recent ones, the method of treatment is decidedly different. From a method essentially *informing* in character, by which the authors of the older books gave, mainly in dogmatic statements, the laws of physics along with many interesting but unrelated facts of the science, all with little or no indication of the experimental processes by which this scientific material had been developed, there is a far cry to the method of approach as followed by recent writers; their studies of the subject are, generally speaking, logical in character, and the spirit of the experimental method of the science seems evident throughout. From the quantity of material handled in the older texts one can judge that the relative importance of the subject in the curriculum was not what the science, by just right, could claim even in those days.

Introduction of Laboratory Instruction.—The laboratory feature of the secondary school treatment was not introduced until late in the seventies; a very few high schools pretended in 1880 to give any laboratory instruction to their students. Yet something of the spirit of the laboratory must have been in the air in those days, for when Gage's "Elements of Physics" appeared in the early eighties, fairly well imbued with the idea of individual experimentation, it acquired wide use and influence largely because of this very feature. It was about this

time (1886 by actual record) that Harvard College began to lead the colleges and universities of the country by an entrance requirement of laboratory instruction. The innovation was made in a very radical manner, we must judge, when we consider the decided change made thereby in the former attitude toward the subject. The emphasis was laid almost wholly on laboratory instruction, with little apparent recognition of the fact that the outlook on the science, got from laboratory work alone, must be somewhat fragmentary; there was not available the amount of time necessary for the large number of individual experiments which would cover the field satisfactorily. The change was too radical indeed; in 1897 Harvard modified its specifications as to the form of elementary physics which it would recognize, laying more stress upon text discussions and lecture demonstrations.

The spread of the laboratory idea in the West proceeded with more deliberation. The high schools of the country have very generally admitted the principle of this conception—in a few, unfortunately, more freely than they have admitted the practice—and although the development is considerably short of ideal, yet the state of affairs, generally, has the advantage and the strength which are the result of steady growth. There are, of course, some of our high schools (too many, indeed) in which the laboratory feature is so little developed that it stands now more as a pretence and as an excuse for a sham relationship of these schools with neighboring colleges and universities, than as a device of real educational value in physics.

Requirements in Physics.—The high school unit of physics, as it is defined by the various teachers' associations of the United States, may be said fairly to be a

satisfactory standard for our schools with their present organization. The specifications of the unit, with considerable uniformity, call for a treatment of the subject in five regular periods a week throughout the usual school year. Commonly four of these periods (of the usual forty-five minutes) are spent in the class work of demonstrations, recitations, and problems, while the other, a double period, is spent in laboratory work. This practice is in keeping with the specification that thirty or forty experiments, predominantly quantitative in character, should be performed by each student during the course. Not infrequently the arrangement is found in which three periods are used for the class work and two double periods for the laboratory. There is much to be said in favor of the latter arrangement of the course, and yet the choice between the two cannot be made fairly without due consideration of the other subjects in the school curriculum. A course in chemistry, generally with a large part of its work done in the laboratory, imparting thereby considerable manipulative skill, and even well-organized courses in manual training, if these precede the physics course, would lead one to choose the former apportionment of periods between the class and laboratory.

In this connection some consideration of the qualities of the laboratory and class-room features may aid us, not only in determining the amounts of each to be incorporated in the course, but also in developing a well-balanced treatment of the content when the adjustment between the two parts has once been made. The laboratory work, mainly quantitative in character, accompanied with a well-kept note-book, is essential to a concrete and detailed understanding of physical laws; from no other

part of the course can our pupils gain first-hand knowledge of the foundations of the science. But the laboratory does not offer a rapid method of mastering the laws and principles of physics, although it does offer an intensive method. With a given amount of time available for the course, the usual arrangement of its content is made as a compromise between a well-rounded development of the subject and a thorough understanding of disconnected parts. Just where the line of adjustment is to be drawn depends largely upon local conditions—upon the presence or absence of related and contributory subjects in the same school, and even upon the interests of the community in which the school is located. For the laboratory work by the pupil and the demonstrations by the instructor should be so correlated as to bring to the pupil as complete an appreciation of the experimental development of the subject-matter as is possible with the equipment of the school. At no time should we lose sight of the fact that physics is an experimental science and needs, therefore, for its proper development, as much of experimental treatment as we can give it. Now the ability of the pupil to comprehend fully the significance of a demonstration experiment, which is performed not directly by himself, depends considerably upon the training which he has had as a child at play, upon the training which he has unconsciously acquired in the everyday life of his community, and again, among many other things, upon the training which he has received in the previous courses of his school career. The more the previous life of the child has led him to think in terms of the relations and processes of the physical world, the more apt he will be in realizing the full significance of demonstration experiments, and indeed of such text and

class discussions as are given without these illustrations. In an industrial community, where the daily content of thought of the people is predominantly mechanical, the main burden of the conversation of the home perhaps of physical import, in cities where one meets such varied and striking applications of physical principles, the teaching of this science presents a decidedly different problem from that which one encounters in a rural or in a commercial community. It is in these last named environments that the teaching of physics and chemistry needs every concrete aid which possibly can be given; it is here that the plan of giving up two double periods of the week to laboratory instruction, leaving three single periods for recitations and demonstrations, will find its greatest opportunity. In a commercial locality, particularly, the instructor will find fewer physical conceptions common upon which he can draw for the proper illumination of his discussions and demonstrations. Here many concrete examples of fundamental principles will require careful treatment, while in an industrial community they would appear self-evident. A requirement of brief lecture notes from the pupils, to outline the salient points of each demonstration—say, the object of the experiment, the apparatus used, and the conclusion to be drawn from the conduct of the experiment—will serve to bring a concrete idea of the significance of a phenomenon which has developed outside of the pupil's own control. Without this aid, the idea may take the indefinite form so often characteristic of second-hand experiences.

The Physics Unit.—As examples of the specifications of the physics unit, which have been made by the various teachers' organizations throughout the country, may be given the definition by the North Central As-

sociation of Colleges and Secondary Schools, made in 1908, and that by the College Entrance Examination Board, made in 1909. Variations from these definitions may be noted in the cases of several later ones, but for most part the variations are in unessential features. I quote here the text of the definition adopted by the North Central Association on recommendation of its committee which was appointed for the purpose of discussing this problem:

**THE NORTH CENTRAL ASSOCIATION'S DEFINITION OF
THE UNIT IN PHYSICS**

"1. The unit in physics consists of at least one hundred and eighty periods of forty-five minutes each (equal to one hundred and thirty-five hours) of assigned work. Two periods of laboratory work count as one of assigned work.

"2. The work consists of three closely related parts; namely, class work, lecture-demonstration work, and laboratory work. At least one-fourth of the time shall be devoted to laboratory work.

"3. It is very essential that double periods be arranged for the laboratory work.

"4. The class work includes the study of at least one standard text.

"5. In the laboratory each student shall perform at least thirty individual experiments, and keep a careful note-book record of them. Twenty of these experiments must be quantitative; each of these must illustrate an important physical principle which is one of the starred topics in the syllabus of required topics, and no two must illustrate the same principle.

"6. In the class work the student must be drilled to an understanding of the use of the general principles which make up the required syllabus. He must be able to apply these principles intelligently to the solution of simple, practical, concrete problems.

"7. Examinations will be framed to test the student's understanding of and ability to use the general principles in the required syllabus, as indicated in 6.

"8. The teacher is not expected to follow the order of topics in the syllabus unless he wishes to do so."

SYLLABUS OF REQUIRED TOPICS

This list of required topics is not intended to include all the material for the year's work. It is purposely made short, in order that each teacher may be free to supplement it in a way that fits his individual environment. It does include those topics which all agree are essential to a first course in physics, and which are capable of comprehension, at least to the extent specified in number 6 of the definition of the unit, by boys and girls of high school age.

- *1. Weight, centre of gravity.
- *2. Density.
- *3. Parallelogram of forces.
- 4. Atmospheric pressure; barometer.
- *5. Boyle's law.
- 6. Pressure due to gravity in liquids with a free surface; varying depth, density, and shape of vessel.
- *7. Buoyancy; Archimedes' principle.
- *8. Pascal's law; hydraulic press.
- 9. Work as force times distance, and its measurement in foot-pounds, and gram-centimetres.
- 10. Energy measure by work.
- *11. Law of machines; work obtained not greater than work put in; efficiency.
- *12. Inclined plane.
- *13. Pulleys, wheel, and axle.

- *14. Measurement of moments by the product of force times arm; levers.
- 15. Thermometers; Fahrenheit and Centigrade scales.
- 16. Heat quantity and its measurement in gram calories.
- *17. Specific heat.
- *18. Evaporation; heat of vaporization of water.
- *19. Dew point; clouds and rain.
- *20. Fusion and solidification; heat of fusion.
- 21. Heat transference by conduction and convection.
- 22. Heat transference by radiation.
- 23. Qualitative description of the transfer of energy by waves.
- 24. Wave length and period of waves.
- 25. Sound originates at a vibrating body and is transmitted by waves in air.
- *26. Pitch and period of sound.
- *27. Relation between the wave length of a tone and the length of a string or organ pipe.
- *28. Resonance.
- 29. Beats.
- 30. Rectilinear propagation of light; pin-hole camera.
- *31. Reflection and its laws; image of a plane mirror.
- *32. Refraction, and its use in lenses; the eye, the camera.
- *33. Prisms and dispersion.
- 34. Velocity of light.
- 35. Magnetic attractions and repulsions.
- *36. Field of force about a magnet.
- 37. The earth a magnet; compass.
- 38. Electricity by friction.
- 39. Conductors and insulators.
- *40. Simple galvanic cell.
- *41. Electrolysis; definition of the ampere.
- *42. Heating effects; resistance; definition of the ohm.
- *43. Ohm's law; a definition of the volt.
- *44. Magnetic field about a current; electromagnets.
- *45. Electromagnetic induction.
- *46. Simple alternating current dynamo of one loop.
- *47. Electromagnetic induction by breaking a circuit; primary and secondary.
- 48. Conservation of energy.

The text of the definition, adopted by the College Entrance Examination Board on recommendation of its committee of secondary school teachers, is as follows:

**THE COLLEGE ENTRANCE EXAMINATION BOARD'S
DEFINITION**

GENERAL STATEMENT.

1. The Unit in Physics consists of at least one hundred and twenty hours of sixty minutes each. Time spent in the laboratory shall be counted at one-half its face value.

2. The Course of Instruction in Physics should include:

(a) The study of one standard text-book, for the purpose of obtaining a connected and comprehensive view of the subject. The student should be given opportunity and encouragement to consult other scientific literature.

(b) Instruction by lecture table demonstrations to be used mainly for illustration of the facts and phenomena of physics in their qualitative aspects and in their practical applications.

(c) Individual laboratory work consisting of experiments requiring at least the time of thirty double periods. The experiments performed by each student should number at least thirty. Those named in the appended list are suggested as suitable. The work should be so distributed as to give a wide range of observation and practice.

The aim of laboratory work should be to supplement the pupil's fund of concrete knowledge and to cultivate his power of accurate observation and clearness of thought

and expression. The exercises should be chosen with a view to furnishing forceful illustrations of fundamental principles and their practical applications. They should be such as yield results capable of ready interpretation, obviously in conformity with theory, and free from the disguise of unintelligible units.

Slovenly work should not be tolerated, but the effort for precision should not lead to the use of apparatus or processes so complicated as to obscure the principle involved.

3. Throughout the whole course special attention should be paid to the common illustrations of physical laws and to their industrial applications.

4. In the solution of numerical problems, the student should be encouraged to make use of the simple principles of algebra and geometry, to reduce the difficulties of solution. Unnecessary mathematical difficulties should be avoided and care should be exercised to prevent the student's losing sight of the concrete facts, in the manipulation of symbols.

SYLLABUS

The following is a list of topics which are deemed fundamental and which should therefore be included in every well-planned course of elementary physics. Only a few of the most important applications of these topics have been mentioned; teachers should add liberally to them. It is expected that the teacher will arrange these topics in such order as to suit his individual needs.

I. INTRODUCTION.

A. Metric System.

Linear measure, units:—metre, centimetre, millimetre.

Square measure—square centimetre.

Cubic measure—cubic centimetre, litre.

Mass:—kilogram, gram.

- B. Volume, weight, density.
- C. States of matter: solids, liquids, gases.

II. MECHANICS.

Fluids.

- A. Pascal's Law of Fluid Pressure. The hydraulic press.
- B. Pressure due to gravity.
Pressure varying with depth and density of the liquid.
Total pressure on the bottom of a vessel.
- C. Principle of Archimedes.
- D. Specific gravity of solids and liquids.
- E. Gases—relation between pressure and volume.
- F. Atmospheric pressure, buoyancy, the barometer, pumps for liquids and gases.

Solids.

- A. Principle of moments.
Parallelogram of forces. (Resolution of forces, rectangular only.)
- B. Newton's Laws of Motion.
Force, momentum, velocity, acceleration.
Uniformly accelerated motion, when initial or final velocity is zero.
Falling bodies.
- C. Mechanical work.
Energy—potential and kinetic.
Conservation of energy.
- D. Machines: Principle of work applied to machines, mechanical advantage, friction, efficiency. (Use terms, effort and resistance.)
Lever, wheel and axle, pulleys, inclined plane.
- E. Uniform circular motion; centrifugal and centripetal forces qualitatively illustrated.
- F. Law of universal gravitation.
Relation of weight to mass.
Centre of gravity.
Stability.

III. HEAT.

- A. Heat—a form of energy.
Temperature, Centigrade and Fahrenheit scales.
- B. Conduction, convection, and radiation.

- C. Expansion of solids, coefficient of linear expansion.
Expansion of liquids, anomalous expansion of water.
Expansion of gases, Law of Charles, absolute zero.
- D. Change of state.
Fusion, the melting-point.
Vaporization, boiling, evaporation.
- E. Measurement of heat, latent and specific heat.
- F. Mechanical equivalent of heat.

IV. SOUND.

- A. Nature and origin of sound.
- B. Pitch, loudness, quality.
- C. Velocity.
- D. Reflection of sound, echoes.
- E. Resonance.

V. LIGHT.

- A. Definitions:
Light, luminous bodies, illuminated bodies, transparent, translucent, and opaque bodies.
- B. Rectilinear propagation of light in a homogeneous medium, shadows, pinhole camera.
- C. Photometry.
Intensity of light (source) and intensity of illumination distinguished.
Law of inverse squares.
- D. Reflection.
Law of reflection. Regular and diffused reflection.
Plane and spherical mirrors, position and character of images.
- E. Refraction.
Laws of refraction (qualitative).
Refraction by plates, prisms, and lenses.
Lenses: Converging and diverging, conjugate foci, principal focus, principal axis.
Position and character of real and virtual images formed by converging lenses.
Dispersion, color, and the spectrum.
Applications: The camera, the human eye, the compound microscope, the telescope.

VI. MAGNETISM.

- A. Magnets, permanent and temporary.
- B. Polarity, magnetic attraction and repulsion.
- C. Magnetic induction, magnetic field and lines of force, permeability.
- D. The earth as a magnet, compass, declination, dip.

VII. STATIC ELECTRICITY.

- A. Electrification by friction; two kinds of.
- B. Electrical attraction and repulsion; electroscopes.
- C. Conductors and insulators; electrification by induction.
- D. Condensers.

VIII. CURRENT ELECTRICITY.

- A. Simple voltaic cell.
Electro-chemical action.
Local action and polarization; prevention of polarization.
- B. Types of cells (Daniell, Leclanché).
- C. Electrolysis.
The ampere.
Electrolysis of water, electro-deposition of metals.
Storage cell.
- D. Electro-magnetism.
Magnetic field around a current.
Relation between direction of current and lines of magnetic force.
Electro-magnets, ampere turns (qualitative).
The electric bell and the telegraph.
- E. Resistance.
The ohm.
Ohm's Law.
The volt.
Power:—the watt and watt hour.
- F. Heating effects.
Fuse wire and electric heater.
Arc and incandescent lamps.
- G. Measuring instruments; galvanometer, ammeter, voltmeter, resistance box.

- H. Series and parallel connection of cells, lamps, etc.
- I. Fall of potential in a circuit.
- J. Electro-magnetic induction.
 Direction and magnitude of the induced electromotive force.
 Simple two-pole dynamo and motor.
 Simple alternating and direct current generator.
 Transformer, induction coil, telephone.

LIST OF EXPERIMENTS

MECHANICS.

1. Weight of unit volume of a substance, prism or cylinder.
2. Principle of Archimedes.
3. Specific gravity of a solid body that will sink in water.
4. Specific gravity of a liquid; two methods (bottle and displacement methods).
 Or,
5. Specific gravity of a liquid by balancing columns.
6. Boyle's Law.
7. Density of air.
8. Hooke's Law.
9. Strength of materials.
10. The straight lever, principle of moments.
11. Centre of gravity and weight of a lever.
12. Parallelogram of forces.
13. Four forces at right angles in one plane.
14. Coefficient of friction between solid bodies—on a level and by sliding on an incline.
15. Efficiency test of some elementary machine, either pulley, inclined plane, or wheel and axle.
16. Laws of the pendulum.
17. Laws of accelerated motion.

HEAT.

18. The mercury thermometer: Relation between pressure of steam and its temperature.
19. Linear expansion of a solid.
20. Increase of pressure of a gas heated at constant volume.
 Or,
21. Increase of volume of a gas heated at constant pressure.

22. Heat of fusion of ice.
23. Cooling curve through change of state (during solidification).
24. Heat of vaporization of water.
25. Determination of the dew point.
26. Specific heat of a solid.

SOUND.

27. Velocity of sound.
28. Wave length of sound.
29. Number of vibrations of a tuning fork.

LIGHT.

30. Use of photometer.
31. Images in a plane mirror.
32. Images formed by a convex mirror.
33. Images formed by a concave mirror.
34. Index of refraction of glass;
Or,
35. Index of refraction of water.
36. Focal length and conjugate foci of a converging lens.
37. Shape and size of a real image formed by a lens.
38. Magnifying power of a lens.
39. Construction of model of telescope or compound microscope.

MAGNETISM AND ELECTRICITY.

40. Study of magnetic field.
41. Magnetic induction.
42. Study of a single fluid voltaic cell.
43. Study of a two-fluid voltaic cell.
44. Magnetic effect of an electric current.
45. Electrolysis.
46. Laws of electrical resistance of wires: Various lengths cross section and in parallel.
47. Resistance measured by volt-ammeter method.
48. Resistance measured by Wheatstone's bridge.
49. Battery resistance—combination of cells.
50. Study of induced currents.
51. Power or efficiency test of a small electric motor.

Chief Aim of Instruction.—In any community the constant and vigorous effort on the part of the instructor

should be to relate the science directly to the life of the pupil, not only to that part earlier than his high school career, but to his life of after years as well. The plan of bringing forcibly to the pupil's mind numerous practical and interesting applications of the laws and principles of physics, in order that his interest in the work may be maintained and that he may be able to make the best use of the subject-matter of the course in later years, is one of utmost importance, one that is quite generally appreciated if we may judge by the unanimity of the opinions expressed in the numerous discussions on the teaching of physics. These illustrations, naturally, should be drawn from the interesting features of the locality. When properly used, no device of teaching can be found more potent than this to give a due appreciation of the importance of physics.

Development of Subject.—Another feature of the class work, which has great possibilities in awakening and sustaining the interest of our pupils, one of undoubted educational value is the tracing of the development of the various parts of the subject, attention to be given to the trend of present growth as well as to the more evident development in the past. Were we able to state at this time that all of the discussions contained in a modern text-book on physics are on such firm foundations as would allow them to be designated as laws and principles, probably one of the chiefest claims of the science to the interest of its students would be withdrawn. Much as we admire the rigor and solidity of those parts of the science which have grown into well-established laws, with none the less interest do we watch its growth as a whole, frequently to find that newer and weaker members are adding their growth to that of the parent stock, increasing

thereby its strength and value. The fact that it is found necessary for the proper growth of a science to lop off, from time to time, some of these minor branches, because they cannot attain the strength and solidity of natural laws, argues nothing against their right to recognition, as well as to existence, while weak. Did not the very laws and principles upon which we now so thoroughly rely take their start as weak and timid extensions from the main stock? And did not the other tentative branches, even though they were compelled to fall in the course of time, add something of strength while they existed?

The interest which is stimulated in us by the realization of the fact that the science is a growing organism is too vital and too valuable to be set lightly aside; the effect, which such interest can have on the attitude of our pupils toward physics, is too important to be neglected. A very appreciable part of the enthusiasm, which one accumulates as he works his way through a science, is got from forward glimpses toward the direction of its growth. And is there not an equal advantage in keeping constantly in mind the process by which this or that great truth has been developed?—in seeing how, as in the past the science grew, one after another of its branches was added and strengthened? How much more do the laws of falling bodies mean to all of us after we learn what methods were used, and what difficulties overcome, by Galileo. The laws of uniformly accelerated motion, to use them again to make this point clear, furnish an excellent example of the generalizing which it is the function of physics to stimulate. In their elementary form they present a front of logic and of definition altogether admirable, even if our admiration is accompanied by little warmth of feeling; but the accompaniment of enthusiasm easily follows

on our part, and on the part of our students, after we have read such an account of Galileo's researches as is given, for instance, in abbreviated form in Mach's "Mechanics."

Criticism of Present Course Ill-Founded.—The fear, expressed again and again in numerous discussions on the teaching of physics in our high schools, that the course, as it is now generally defined, is not accomplishing the ends desirable for the general pupil, but is designed rather to fulfil the requirements for college and university entrance, seems to me to be ill-founded. Any lack of accomplishment—and we are all compelled to admit this deficiency for some schools—would seem to be due to an improper handling of the course rather than to poor design in the content. That in some schools the laboratory work is so conducted as to deserve the name of a "starvation course in measurements" argues not so much against the definition of the laboratory feature of the course as against the conception, of the teachers of these schools, of the real educational significance of the laboratory function.

There is no reason for the use of apparatus so complex and so delicate, and at the same time so difficult of management, that the student must be more concerned with its manipulation than with the physical interpretation of the experiment. The use of a good grade of spring balance for the determination of the specific gravity of chunks of metal, or of a stone, would be preferable to the far more expensive equipment for this experiment in many schools. In no part of the equipment of a school is there better chance for good judgment than in the choice of apparatus for its science laboratories. For any experiment that apparatus is best which has the simplest design and greatest ease of manipulation. That method of experimenting

is always best which flies in a simple line straight from the shoulder to the result aimed at.

A second advantage in the choice of simple apparatus lies in the ease of equipping these schools which have inadequate resources for their laboratories. I am not making, by these statements, an excuse for cheap or shoddy apparatus. By all means, the equipment of our laboratories should be good, substantial, and trustworthy—such as will command the respect of our pupils—but elaborate and delicate of manipulation it ought not to be. I should like, in this connection, to make a plea for such equipment as will bring to the attention of the pupil quantities really appreciable to the senses—for the use in the laboratory of masses of several hundred grams, or of a pound or two, instead of five or ten grams—for the statement of problems in the class room, for all that, in terms of reasonable quantities instead of in terms of such insignificant masses and forces as would keep the pupil from seeing the true relationship of the magnitudes involved.

The further claim that the use of algebra and geometry, to express the quantitative relations handled in the class room or in the laboratory, serves only to confuse the progress of the pupils, and that they use their mathematics merely as a tool for the obtaining of certain results which would be reached better by reasoning, is one frequently advanced. There is, indeed, some ground for the fear that pupils will accept a mere symbol with which to work rather than the definite physical concept for which it stands; but the function of a physics teacher is to see that proper physical concepts shall be formed. With this accomplished, the distance which the pupil can go in the science, in a given time and with a given amount of energy, with the aid of his algebra and geometry, is

far beyond his reach without this aid. The instructor should keep in mind always the fact that the mathematical part of physics is a device for the economy of energy rather than an end in itself. No better field than physics can be found for the concrete application of the simple processes of high school algebra and geometry. The trouble under discussion does exist—I have met the results often enough—but the solution of the difficulty lies in strengthening the course by the use of better text-books and by better training of our teachers, rather than in the further weakening of the course through dilution of its content.

It would be only fair to indicate here that such criticisms of the present (common) physics course as I have noticed in the preceding paragraphs do lead in many cases to suggestions of excellent changes in the conduct and content of the course. I cannot do this in any better way than to incorporate in this discussion a short article on the physics unit which appears in the 1911 Bulletin for High Schools issued from the office of the State Superintendent of Public Schools of Kansas. The article was written by Professor C. R. Mann, of the University of Chicago.

“Physics, as a subject for high school instruction, has a double advantage. It is not only so intimately related to the pupils’ daily lives that they already possess a large range of concrete experience on which to base their work, but it also is essentially a science of measurement capable of training the pupils in quantitative thinking and in an appreciation of the value of definite, quantitative knowledge. It is both concrete and abstract—practical and theoretical. It therefore offers unlimited opportunities of training pupils in the methods of thinking by which

all real knowledge is obtained; and, conversely, of giving them greater control of their physical environment by teaching them how to apply the knowledge thus acquired to the world of practical affairs in which they must live.

"In order that physics may realize the two distinctive ends just mentioned, it is essential that the pupils gain clear ideas of the meanings of the terms used as well as of the laws and principles developed. But the clearness with which a given idea or principle is grasped is usually proportional to the number of familiar experiences which are associated with that idea or principle; and, conversely, the association of a large number of familiar experiences with an idea or a principle renders the application of that idea or principle to daily experiences much easier and more certain. Therefore, in teaching a physical principle, it is not sufficient to introduce it and demonstrate it with a piece of unfamiliar apparatus on the lecture table or in the laboratory. If only this is done, the pupil will be left in the mental condition of the Frenchman whose only idea associated with the notion of specific gravity was two copper cylinders, one of which fitted inside the other.

"Successful teaching of physics requires both class work and laboratory work. These two kinds of work must supplement each other and the topics treated should be as far as is possible the same in both. Without the actual performing of experiments in class and laboratory, the text-book is almost meaningless, and is soon forgotten.

"It is generally better to introduce a topic by means of informal discussion with the class concerning familiar experiences. For example, if the topic is specific gravity, the knowledge already in the possession of the class should first be called forth by means of questions con-

cerning their experiences with floating and sinking of such familiar things as their own bodies, chips, corks, logs, cream, ice, stones, nails, lead keels, fishing sinkers, etc.

“When the principle or idea under discussion has been brought out by such discussion, it should be defined or demonstrated by one or more experiments, and then fixed by requiring the solution of a number of simple, real, concrete problems. If the class work has been skilfully conducted, a number of problems or disputes will have arisen of a sort that can be settled only by making experiments and measurements.

“The laboratory is the place in which to settle such problems and disputes. In the ideal case, the results of each laboratory experiment will solve some problem or settle some dispute, and the more concrete and significant the problem or the dispute, the greater the value of the work. For example, the pupils will probably get much more valuable training from the laboratory work in specific gravity if they be shown first a rectangular block of oak and be asked who can predict how high it will float out of water, than if the experiment is presented in the usual way, namely, ‘Find the specific gravity of a rectangular solid body lighter than water.’ In the first case a problem is presented, measurement is required for its solution, and the competitive sense is appealed to; in the second case there is no problem that has any significance to the pupils.

“When the laboratory is used as a court of appeal where disputed points can be settled, the work there helps to fix in mind and to clarify principles besides giving discipline in scientific thinking; but when it is used merely to determine the specific gravity of a body heavier than

water, or that of a body lighter than water with a sinker, or of a liquid with a pycnometer, or of a liquid by Hare's method, etc., the work tends to give training in little beside the technique of the physicist. The work of the high school is to educate boys and girls, not to train research physicists.

"Since the laboratory is the place to solve problems that cannot be solved without experiment and measurement, the most fruitful type of experiment is the one whose result is not known in advance. The attempt to determine physical constants whose values are known with far greater accuracy than it is possible to hope for in an elementary laboratory is, to say the least, discouraging. Thus, the theoretical mechanical advantage of an inclined plane or of a set of pulleys is known in advance; but the actual efficiency of a given plane or pulley is not known, but depends on how the machines are handled. If the student is asked, What is the greatest efficiency of this inclined plane? Is it greater with large load or with small load? he will probably get far more real training from his work than he will if asked to 'verify the law of the inclined plane.' In the former case he has a problem to solve, and the solution depends on what he is able to make the plane do; in the latter case he has to make his results tally with the theory.

"Other similar problems that lead to significant and valuable laboratory work are: What is the maximum efficiency of a small water motor? Which kind of gas burner is most efficient on cook stoves? Which boy's electric motor is most efficient? How much more efficient is a tungsten lamp than a carbon lamp? What kind of a lens shall I get for a camera for making pictures for lantern slides?

“Probably the most difficult task that confronts the physics teacher in the small high school is to start the equipment of a laboratory on small means. The first maxim is, buy for use and not for show. Buy the less expensive first. Get the necessities before the luxuries. Do not begin by the purchase of Geisler tubes and X-ray apparatus. Also, do not forget that the members of the class probably possess boats, motors, engines, telegraph outfits, and many other similar things which they are not only willing but eager to bring to class and explain. The local industries, shops, and factories also offer rich opportunity for making the work vital and significant.

“In offering suggestions in regard to the equipment of a laboratory, let us begin with the room itself. This should be dry, well lighted, and, if possible, with south exposure.

“The room should be provided with heavy, flat-topped tables, about thirty-two inches high. The length and breadth of these must often be adapted to the shape of the room, but, when possible, tables three feet wide and eight feet long will be found very convenient. These tables should have no iron in their construction, if possible, and the top should project at least three inches. Any good carpenter can make these tables.

“If there is a good water system in the building the laboratory should be provided with a sink. If not, a wooden tank a foot deep, two feet wide, and three feet long, lined with lead or galvanized iron, will be found convenient. If the laboratory can be supplied with gas, the fixtures should hang from the ceiling directly over the tables and about four feet above them. Connections can then be made with Bunsen burners by the use of rubber tubing. If no gas can be provided, gasoline torches handled with care are the best substitute.

“Cases for storing apparatus should be about fourteen inches deep, with movable shelves and glass fronts. They should be self-locking, and all open with the same key. It is to be noted that hard-rubber apparatus should be stored in a dark place. A class in physics consumes at best more of the teacher's time than one in most other branches. Everything about the laboratory should be arranged to facilitate the getting out and putting away of apparatus. Then the teacher should be expected and required to see that all tools and apparatus be locked up when not in use.

“A few tools for making and repairing apparatus are an essential part of a laboratory equipment. There should be at least a small carpenter's work-bench and the following tools: Vise, fine-toothed saw, small plane, brace, drills, screw-drivers, pliers, files, small claw-hammer, tinner's snips, small soldering-iron, hack-saw.

“Experience has taught us that the average teacher of physics is liable to err in requiring the class to study too many topics and do too many experiments. The result of such an error is that the pupils become confused and also acquire careless habits in the use of apparatus and the making of measurements. They are apt to get the habit of being satisfied with hurried and slovenly work. It would be far better for the teacher to select half the number of experiments, and to see to it that each member of the class performs each experiment individually, and preserves a description of his work and its results in neat, orderly, readable form.

“The following list of topics was prepared by a committee of physics teachers of the North Central Association of Colleges and Secondary Schools. It contains the subject-matter which all teachers agree is desirable for a

first course in physics. A pupil who has learned this material well has done a good year's work in physics. It is, however, possible to increase the number of topics without leading to superficial work. Those with stars opposite them are the ones best adapted to furnish laboratory problems. (See the definition of the physics unit quoted earlier in the chapter.)

"The following list of laboratory problems are suggested as suitable ones to accompany the topics in the syllabus. Each student should do at least thirty experiments of this type:

1. How find the centre of gravity of an irregularly shaped piece of card-board or sheet metal? How prove that the point found is the centre of gravity?

Irregularly shaped card or sheet metal.

Plumb line.

2. Which requires the stronger foundation, a brick wall or a concrete wall of the same dimensions?

Brick, block of concrete.

Spring balance, meter stick.

Which weighs most, a wooden bridge containing 500 cubic feet of spruce or an iron bridge containing 100 cubic feet of iron?

Block of spruce, block of iron.

Spring balance, meter stick.

3. What is the tension on a tie rod that supports an electric arc lamp that weighs 70 pounds?

Spring balance, wooden stick, string, weights.

4. A colt can pull half as hard as a horse. How arrange a whiffletree so that the two can be hitched to a wagon and each get his share of the load?

Two spring balances, meter stick, string.

5. Do gas meters measure gas at the pressure of the atmosphere or at the pressure of the gas in the mains? Which method would give the consumer the most gas for his money? How much more?

Water manometer to measure gas pressure, Boyle's law tube to measure change in volume with change in pressure, two large iron pails to measure gas, school gas meter.

6. Given the diameter of the gasometer of the local gas works, measure the gas pressure and compute the weight of the iron top of the gasometer. What difference in level in the water level inside and out of the gasometer? Construct model and verify conclusions. Compute volume of water displaced and get weight of gasometer top and confined gas.

7. How many cubic feet of pine are required to float a 100-pound boy entirely out of water?

Block of pine, meter stick, spring balance.

8. Five cubic feet of lead are used in the keel of a boat. How much does the lead weigh out of water? How much does it weigh under water? Would it sink the boat as far when it is fastened to the keel under water as it would when placed in the boat?

Chunk of lead, spring balance, jar of water.

9. Does it take more work to slide a cake of ice up an inclined plane than to lift it vertically to the top of the plane? If so, how much more? What is the maximum efficiency of the inclined plane in the laboratory?

Inclined plane, glass plate to cover its top, car, spring balance or set of weights.

10. Is more work required to pull a safe up to the third floor with a set of pulleys than to carry it up by hand? What is the maximum efficiency of the pulleys in the laboratory?

Pulleys, load to represent the safe, spring balance or set of weights.

11. Repeat 10, using the wheel and axle.

12. Does it require more work to lift a stone with a crowbar or to raise it directly by hand through the same height?

Lever, spring balances or set of weights.

Is the efficiency of the lever ever greater than 1? If so, why?

13. How much ice is needed to cool a gallon of water at 30° C. to 2° C.?

Calorimeter, ice, thermometer.

14. How much ice is melted in a refrigerator when an aluminium kettle at a temperature of 30° C. and which weighs 1 pound is placed in the refrigerator and cooled to 2° C.?

Aluminium chips, calorimeter, thermometer.

15. Which gas burner is more efficient, a Bunsen burner or a gas-stove burner?

Bunsen burner, gas-stove burner, kettle of water, thermometer. Time rise in temperature of given amount of water. Note gas consumption on meter, or use Thorp gauge.

16. On a given burner, which kettle is most efficient?

Several kettles, thermometer. Note time required to heat given amount of water a given number of degrees.

17. In an open kettle of water that takes 15 minutes to come to a boil, how much water will boil away if the kettle boils for 5 minutes?

Try it and compute the heat of vaporization, or measure the latter and compute it, testing the conclusion.

18. What is the temperature at which dew forms to-day?

Dew point hygrometer.

19. Which makes the best lining for a fireless cooker, an air space, felt, excelsior, mineral wool, etc.? Are any of them as good as a "thermos" bottle?

Thermometer and materials to make different cookers.

20. How is a siren whistle constructed and why does it produce the peculiar effect?

21. How long are the waves of sound from your own voice?

Tune voice to organ pipe or other air column.

22. Can you make a photograph without a lens?

Pinhole camera.

23. Why is the image in a plane mirror reversed?

Make diagram by sighting images of pins.

24. What makes the "cow's hoof" in the bottom of a glass of water when it is placed below and to one side of a candle?

25. How do luxifer prisms or holophane shades send light into dark corners and help light up dark rooms? Why is there no color in the light transmitted by them?

Trace light through prism.

26. Do different sized cameras when pointed from a given place at the same object all give images of the same size? Is there any relation between the size of the image and the distance from the centre of the lens to the ground glass?

Several lenses of different focal lengths, meter stick.

27. At a given distance from a compass needle, in what position does a magnet produce the greatest deflection?

Trace lines of force about the magnet with the compass needle.

28. Which form of voltaic-cell is best for door bells? Which for telegraph lines? Which for toy motors? Test them and find out why.

29. Why is it better to connect house electric lamps in parallel?

Try them both in series and in parallel. Measure with voltmeter and ammeter.

30. Which radiates more heat per watt-hour, a carbon lamp or a tungsten lamp? -

Calorimeter, voltmeter, ammeter.

31. Which furnishes the most light per watt-hour, a carbon lamp or a tungsten lamp?

Voltmeter, ammeter, photometer.

32. What makes the motor go?

St. Louis motor.

33. What is the efficiency of a small motor?

Voltmeter, ammeter, motor, brake.

34. What is the efficiency of the dynamo in the school or town?

35. What is the efficiency of a small water motor?

36. Which kind of coal for sale in your town gives the greatest number of heat units per pound? Which gives the greatest number of heat units per dollar?

37. Is the heat equivalent of the city gas up to standard?

38. What is the most efficient steam engine in town? (Express result in pounds coal per H. P. H.)

39. Does the ventilating plant in your school supply the requisite amount of fresh air (3,000 cubic feet per person per hour)?

40. How much coal is burned per day at your school? How much of the heat gets used up in heating the air? How much of it is lost up the chimney? Could the heating plant be improved? How?"

In what has just been said about the adaptation of the physics course, as generally defined, to the real needs of the high school pupil in after life, the constant effort has been to keep in mind the criticisms, which have been

made so freely during recent years, against the dictation of colleges and universities in this definition. The statements of the chapter have been made with a feeling of greater certainty in view of the fact that one of the latest definitions was drawn up by a committee of successful secondary school teachers, and in view of the further fact that their definition did not depart essentially from the previous ones. The real test of the value of a physics course, with whatever "definition" it may be in accord, lies in the ability of the pupil to apply physical principles in the solution of his every-day problems; it should be the constant aim of the instructor to train this power of application. The one great danger is that the instructor may yield to the temptation, laid constantly before him by some text-books, to include too much material in the year's work. Indeed most text-books of physics would benefit by judicious pruning. Thoroughness, above all things, is of value in physics teaching.

Future of Physics in the Schools.—There are many teachers of science in America who believe that before many years pass the subject of physics will be accorded an important position in the education of our children and in their life in after-school days—recognized to such an extent, indeed, as to have provided for it a more extended treatment in our high schools than now is allowed it. When this change comes, a short course, mainly descriptive in character, should be put into one of the early years. Such would serve very satisfactorily as a forerunner of the chemistry of the curriculum, as well as of the main physics course. The action of the National Education Association recommends that, where both chemistry and physics are taught, physics shall be given in the third year and chemistry in the fourth. The action

represents an essential agreement with a minority report of its "Committee of Ten," appointed to consider the correlation of the various subjects of the curriculum. The committee report itself favored the reversed order. The reason expressed for the minority report was "that chemical theory so completely depends upon an intelligent conception of its relations to physical laws that previous training in the latter would seem indispensable." This reason may be sufficient for the action taken, and undoubtedly the recommendation will be followed wherever a situation arises calling for decision on the point involved; but when such conditions, as are expressed here, do not exist, the place for physics is undoubtedly in the fourth year. Physics needs this year (from the third to the fourth) of mental development, and it needs the aid of the third year of mathematics; it needs these more than does any other study in the curriculum. A good solution of the difficulty would be provided by this elementary first course in physical science.

The Training of Teachers.—From the discussion of this chapter the inference is that considerable stress is to be placed upon the training of the teacher as well as upon his native ability and adaptation to the science. I believe that the solution of many of the difficulties which beset the teaching of physics in our schools lies here. Moreover, a great part of the responsibility for whatever of unsatisfactory condition exists is due to the unsatisfactory method by which the physics teachers are trained in our colleges and universities. A part of the responsibility again lies at the doors of the officials of the school, who seem willing in many localities that physics should be taught by a teacher with no other training in the science than one general course in addition to the ele-

mentary physics itself. When these officials shall require as high standards of preparation of their science teachers as they now do of their language teachers, physics will make a long step forward in its service to the great mass of our citizens.

From a slightly different point of view, attention was called to the importance of a knowledge of the historical development of the science, both for the instructor and for the pupil. No other feature of science training is so efficient in bringing the whole subject into view in proper perspective.

The instructor, further, besides being interested in the past development of physics, should be in touch with its present and future development; for this also means a more efficient guidance of the pupil's interests. The growth of the science may be followed best by keeping in touch with the experimenters of the period; for by such acquaintance the general trend of growth may be seen. An abstracting journal, such as the admirable *Science Abstracts* in English, is almost necessary for this purpose. I can do nothing better here than to call the reader's attention to an address by Nichols,¹ before the Physics Club of New York, on "Research Work for Physics Teachers," a paper which, even in short abstract, is admirably suggestive for teachers.

¹ Nichols, E. L., *Science*, 13, 202; 1901 (abstract).

CHAPTER VIII

CHEMISTRY

J. E. MILLS, PH.D.

FORMERLY ASSOCIATE PROFESSOR OF CHEMISTRY, UNIVERSITY OF
NORTH CAROLINA; CONSULTING CHEMIST, COLUMBIA, S. C.

Should Chemistry be Taught in the High Schools?—
The knowledge which fits a child best for life is that which enables him best to understand and to appreciate his surroundings. The training which fits a child best for life is that which trains him best to see truly, to think clearly, and to apply his knowledge.

What is chemistry? In what way does chemistry touch the life of the average man? Will a knowledge of chemistry prove of benefit to the ordinary laborer, or farmer, or mechanic, or business man? Such questions have been often asked, and my almost invariable reply to the questioner is, "Name *anything* about you with which chemistry has nothing to do?" It makes little difference as to the reply—cloth, paper, glass, wood, brick, the body itself, the food that we eat, and the earth upon which we walk—chemistry teaches of the constitution of these bodies, of the way in which they are made. For the things by which we are surrounded, and we ourselves, are made up in a wonderful way from a very few simpler bodies. Just as brick and stone and wood and mortar can be used to make a city full of houses each different from the other, so a few simpler bodies are so

united and put together as to make all of the wonderful world with which we are in every-day contact. Surely, it is interesting to know something of the things of which this wonderful world is made, and something of the way in which they are put together, and something of the changes which they undergo. For fire does not destroy wood, or coal, or oil—it merely changes them. The food we eat becomes a part of our body. Similarly, trees and plants grow because they absorb the necessary food from the soil and from the air. Some knowledge of these wonders makes life broader and more full of meaning and of pleasure. Is it right that students should be allowed to pass out of the high school and enter upon their life's work in total ignorance of the structure and changes of the entire world about them?

Chemistry in the high schools should be made a wonderfully interesting study and a study that would contribute a lasting interest to life; but this is only one part of the story. Each man's present life, as he lives it under the conditions of our modern civilization, has been made possible only by the knowledge of chemistry which the world has come to possess. A knowledge of chemistry has made possible the production of iron from its ores, and every step of civilization has been dependent upon that knowledge. But that industry is only one of a hundred industries dependent upon a knowledge of chemistry for their existence or for their present perfection. The production of copper and silver and lead and tin and zinc from their ores, and the winning of gold, are dependent upon chemical processes. The chemist explains how best to produce brick, and cement, and mortar, and concrete, for the purpose in view. He supervises the manufacture of glass, of paints, and of dyestuffs. He is a

necessary adjunct to the sugar refinery and of the soap factory. Not alone for the material of the printing-press, but for the paper and the ink as well, a debt is owing to the chemist. He aids the physician with his drugs and the farmer with his fertilizers. To his care is largely entrusted the carrying out of the pure-food law and the inspection of drinking water. The above are only examples. Literally in a hundred ways the knowledge of the chemist touches the home life of nearly every man, woman, and child in the United States. All of the chemical processes mentioned, and the numerous others, can be taught in no high school. But a foundation for further reading can and should be laid, and some of the simpler, and locally more important, processes should be taught.

There is yet another side to the story—the knowledge of chemistry may prove directly *useful* in the home or in the daily life. A little knowledge of chemistry enables one to understand far better than is otherwise possible the valuable information given in the many useful bulletins, reports, and magazine and newspaper articles on such subjects as health, hygiene, sanitation, pure and impure foods, pure and impure paints, patent medicines, fertilizers, scientific farming, insecticides, disinfectants, wood preservatives, etc. A little knowledge of these matters is often the means of saving many dollars. Sometimes, too, it is useful to know how to remove a stain, or to remember that the antidote for carbolic acid is alcohol.

Specific Mental Disciplines Involved.—So far only those points have been considered which belong more particularly to a course in chemistry. The general educative value of the course is not greatly different from that of the other science courses. Chemistry is not a “memory” sub-

ject, but it does require that the facts learned to-day shall be used, not forgotten, to-morrow. It necessitates at almost every step reasoning from things seen to things unseen, and from particular facts to general laws. It cultivates the scientific use of the imagination. It gives the student opportunity to apply his knowledge of mathematics, English, and drawing. It gives him skill in the use of apparatus and fits him for further similar work later. It develops accuracy, self-dependence, and intellectual honesty. It furnishes him an insight into—nay, more, it even introduces him personally to the methods that have been and that are used in the study of nature and natural laws. It encourages his innate desire to ask questions and teaches that lesson which it took the human race many centuries to learn—that the questions must be asked, not of men, nor of books, but of the things themselves. Surely, there comes to every teacher the opportunity, as his pupil stands face to face with some wonderful law of nature, to inspire the feeling—"The place whereon thou standest is holy ground." These points are left without further emphasis in this article solely because they concern science generally and not chemistry more particularly. Let no reader underestimate their importance.

We have argued that chemistry has a place in the high-school curriculum because, *first*, it teaches of the constitution and changes of the world about us, and the information adds a new interest to, and a new appreciation of, life. Because, *second*, the advance in chemical knowledge is felt in a hundred ways in every home life to-day. Because, *third*, chemistry gives much specifically useful information. Because, *fourth*, chemistry, if properly taught, is one of the best imaginable subjects to train the

pupil to *see for himself, to think for himself, and to do for himself.*

The Past and Present Status of Chemistry in the High Schools.—It should be clearly recognized that the study of chemistry in the high schools is not to-day in a satisfactory condition. Taking, first, a glance at the country as a whole it will be noted from the table below that chemistry has lost ground during the last twenty years. This loss (shared also by physics) is the more significant

PER CENT OF STUDENTS STUDYING CHEMISTRY

	1889-90	1894-95	1899-1900	1904-05	1909-10*
Private high schools	8.59	9.79	9.34	8.80	9.38
Public high schools.	10.10	9.15	7.72	6.76	6.89
Total.	9.62	9.31	8.00	7.04	7.13

* 9,378 public and private high schools reporting 817,653 students. These data are from information furnished by the Commissioner of Education.

in that it has occurred during a period of wonderful advance in the applications of science and of greatly increased expenditure for high school equipment.

In considering the present status of chemistry in the high schools, it should be remembered that chemistry is usually taught in the fourth year of the high school course and that probably slightly over half of the fourth year students do study chemistry. Moreover, something of the past history of chemistry as a science should be borne in mind. As a science, chemistry commenced its existence only a little over a hundred years ago. For years there were no laboratories for student instruction. The first was opened by Liebig at Giessen in 1825. After that date laboratory instruction in universities became

increasingly common, but chemistry had to wait for years for general admission into the school curriculum. Once admitted, neither in prestige nor in the methods used for instruction could it rank with the long established classics and mathematics. In 1888 Harvard College, for the first time, included chemistry among the subjects that might be offered for admission. Since that time, slowly it is true as was to be expected, chemistry has been gradually accorded a place among the subjects admitting to entrance credit into the various colleges and universities. Its full recognition has been hastened in many places by the unit system introduced by the Carnegie Foundation.

Difficulties in the Way of Successful Teaching of Chemistry.—First might be placed the past history of the subject. Unsuccessful methods of teaching will linger after they have been proved failures. The four-year high school is not the place for a course in qualitative analysis. Nor is the high school the place for studying the details of the numerous compounds, important though they may be, with which chemistry as a science has to deal. Nor is it advisable that the high school course should be but a briefer model of some college course designed for the professional chemist or the technically trained scientist. The history of one high school¹ can be taken as illustrative of the change in science teaching that should take place in many. After a series of years in which the science course had proved a failure this school remodelled the course, aiming chiefly (1) to give the pupil a broad general view of the whole field of science, at the same time arousing his interest and getting him awake to the possibilities of the work; (2) to explain to the pupil his everyday environment, showing him that the science of the

¹ Springfield, Mass. See *Teachers' College Record*, vol. XI, 63, 1910.

school-room and the science of the outside world are one and the same thing. The result of this change was the immediate success of the science department.

The second difficulty lies in the nature of the subject itself. Some knowledge of mathematics and physics is desirable. Chemistry makes use of symbols and equations and deals with numerous facts which at first appear almost totally disconnected. Moreover, atoms and molecules and their relations cannot be seen with the naked eye or with the microscope. The changes with which chemistry is concerned must be inferred from the results of experiments upon millions of particles taken together. The query "I've washed the ketchins and caught the drippins and what must I do next?" illustrates the attitude of many students when they first deal with a precipitate and filtrate. How can the student infer the wonderful changes in composition and structure of which the precipitation and separation are but signs? Time, attention, and patience are required to give the student the proper "attitude" toward his work.

The third difficulty lies in the fact that some sort of laboratory teaching (not *necessarily* perhaps in a laboratory) is essential. The installation of the laboratory is a matter of difficulty, requiring much technical knowledge and considerable expense. The laboratory teaching consumes the time of the teacher, and some students do not adjust themselves readily to the laboratory surroundings and work.

Other difficulties will be met by the teacher of chemistry. Their detailed discussion and specific advice are avoided because the best solution of the difficulties depends largely upon the individual teacher. No agreement as to the value of specific suggestions would be found be-

cause each teacher can best meet his own difficulties in his own way. Thus, in the care of apparatus, one teacher will require individual desk equipment and carefully checked lists for each student. Another will instil into his class such a "laboratory spirit" that intentional disturbance of another's apparatus is practically unknown. Neither teacher would succeed as well using the system of the other. Every teacher should "take stock" once in a while of his class, the results he is obtaining, and of his methods, and meet his difficulties after a broad consideration of ways and means.

Suggestions as to the Teaching of Chemistry.—If the objects for which chemistry is taught are kept clearly in view, serious errors in the method of teaching will be largely avoided. The following hints may prove of help to some:

1. *Interest the pupil in his surroundings.* Get him to asking questions about the composition of water, air, wood, brick, soil, rocks, sugar, salt, food—in short, anything with which he comes in contact—and questions about the changes which these bodies do and can undergo.

2. *Interest the pupil in any local chemical industry.* If in the country, pay particular attention to soils and fertilizers, the chemistry of dairying and of breadmaking, etc. Have reference books at hand and encourage the pupil to read about the manufacture of any article in which he has become interested. He will remember possibly more than you think, but the habit of "looking things up," if once acquired, will be of more benefit than the immediate knowledge gained.

3. *Keep your eyes always open to give the student some specifically useful knowledge about soils and fer-*

tilizers, paints, dairying, insecticides, disinfectants, preservatives, patent medicines, removing stains, antidotes for poisons, etc. Some seed is sure to fall on good ground where it will bring forth a hundred-fold. *Make the information practical.* Devote a day to headache preparations, expose the patent medicine frauds that advertise in the local papers, study the community water supply and its purity. If some college professor or examination board thinks that the students' time could be better spent in studying the compounds of magnesium and their properties, think the matter over and see if you can agree with them. Probably few teachers could, and perhaps none should, treat of all of the subjects mentioned. It is not intended that the course should primarily be industrial or technical.

4. *Try to give the pupil an outline of chemical science—its primary laws and its theories.* While his interest is being aroused and certain useful facts are being taught in a more or less hop, skip, and jump fashion, do not forget that chemistry is a science, and, therefore, lay as sure a foundation for further work as your time and skill will allow. The pupil's interest is at first the great thing to be gained, but *guide his interest.* Don't follow his every impulse, but in addition to any side questions that come up, make some definite progress in a given direction with each lesson. The amount of the *science of chemistry* that can be taught in an elementary home fashion is limited almost solely by the knowledge and skill of the teacher.

5. Remember always that it is not *what the student knows*, but *what he is able to do* in after life that determines his success. Therefore, in all of your teaching make the pupil *think for himself and do for himself*

Cultivate his imagination; it is a valuable aid to right thinking. Every question asked and answered by the pupil himself is worth ten asked by you and answered by the pupil with your aid. But do not let him waste too much time foolishly. Remember that perhaps most of his questions neither you nor any one else can completely answer.

Teach him where and how to get more knowledge, because knowledge increases the power to *do* things.

6. *Do not make the course a mere memory exercise.* Where this is done the fact that the student on examination describes hydrogen for chlorine is not surprising. Only good luck could keep him from making some such mistake. But worse than the mistake—his knowledge when gained is so far removed from his environment that it is perfectly useless to him. Why not call hydrogen chlorine?

7. *Review constantly.* "We do not learn things once for all."

8. *Illustrate the course with experiments where practicable.*

9. *Do not design the course primarily to satisfy a college entrance requirement.* Do not be over anxious to obtain college credit for the course. For college entrance the important question in the past has been "What do you know?" In life the important question is "What can you do?" Some day the colleges and universities will recognize that the training which best fits a man for life should be acceptable as an entrance requirement, and adjustment of credits will follow.

Suggestions as to the Laboratory Equipment.—There is marked difference of opinion here. I would like to contrast two quotations. "If the facilities of the school

preclude the possibility of providing room and apparatus for laboratory work, the natural science in the programme should either be reduced to a minimum or temporarily eliminated. As facilities for the laboratory work become available it is well to equip adequately for work in one science, omitting all others for a time if necessary. . . . Generally speaking, chemistry should not be introduced into the programme until a suitable room can be devoted entirely to the laboratory."¹ This attitude is responsible for the lack of chemistry courses in numerous high schools. The other quotation is taken from the description given by the chemist, Wöhler, of his visit to the laboratory of Berzelius, in which so many famous discoveries had been made. "No water, no gas, no hoods, no oven, were to be seen; a couple of plain tables, a blow-pipe, a few shelves with bottles, a little simple apparatus, and a large water barrel whereat Anna, the ancient cook of the establishment, washed the laboratory dishes, completed the furnishings of this room, famous throughout Europe for the work which had been done in it. In the kitchen which adjoined, and where Anna cooked, was a small furnace and a sand bath for heating purposes."

The laboratory equipment can be made as expensive as desired, and in many cases considerable expense is justifiable; but an expensive equipment is not an absolute necessity. If only a few dollars are available a start can be made. A poor equipment does require more time and skill on the part of the teacher. The proper adjustment of the quality and quantity of chemicals and apparatus, and the numerous details of laboratory equipment, to the needs and finances of a particular school, are matters requiring so much technical

¹ Brown, "The American High School," pp. 147, 183.

knowledge that in every State some authority should be provided from whom efficient aid and direction can be secured by any school desiring assistance.

Suggestions as to the Laboratory Work.—1. The laboratory course should be designed to increase the pupil's interest in his work, to increase his power to *see, think, and do* for himself, and to make him acquainted with the chemicals, methods of manipulation, reactions, and laws, at first hand.

2. Have the pupil keep a laboratory note-book, and insist on *the use of reasonably good English, on neatness, and on clearness, and that all entries shall be made when the experiment is performed.* Full directions, some explanations and questions, are useful in the laboratory manual, but strictly guiding subheads are to be avoided. A loose-leaf system is an advantage.

3. The attention of the teacher must be given repeatedly to each individual student while in the laboratory.

4. Some problems should accompany the course in chemistry. These problems should always be practical and should be made more of a laboratory than a classroom exercise.

5. Do not have much exact measurement. A student may measure a thing exactly and know nothing about it. In fact his mind is easily diverted from the real problem to the mechanical details of the measurement. Some science courses have been aptly called "starvation courses in measurements."

6. Sacrifice some of the experiments "in the book" for some more nearly *home-made*. The added interest will repay the trouble.

7. Make the student think, but do not expect him to rediscover chemical laws, or to prove them. A little

consideration of *any* law will probably show you that you could not, if turned loose in the best chemical laboratory in the country, prove the law in six months. Let the experiments illustrate the laws; they will help the student to remember and to understand them.

8. Sometimes the student gets more results than he can take care of. He may not select the one that you had in mind. Do not expect him always to draw *your* conclusion, *without your assistance*, from an experiment assigned by *you*.

Time and Position to be Allotted to the Course in Chemistry.—As to the time to be devoted to a study of chemistry, a hard and fast rule is certainly neither possible nor desirable. No adequate discussion of this subject could omit a consideration of all of the science courses at the same time. We are then confronted with a fact particularly emphasized by G. H. Mead.¹ "The sciences in the high schools are hopelessly isolated. They exist in water-tight compartments, with none of the interrelationships which are implied in their own subject-matter, and which are essential to their comprehension, especially for the student of this period." Science teaching should begin early in the elementary school and proceed by carefully graded steps throughout the last year of the high school. At the present time the arrangement of text-books and subjects, and the adjustment of teachers, makes this a matter of great difficulty. But only in this way could the very large number of students who fail to complete the high school course gain some elementary knowledge of the various sciences—that is to say, gain some scientific knowledge of the world about them, in which they are to live.

¹ *School Review*, vol. XIV, 240, 1906.

Under this ideal arrangement, to be realized when possible, much elementary chemistry has found its way into the various science courses devoted mainly to other subjects. The more formal and scientific development of the subject can then well be postponed to the last year of the high school, or perhaps the course can be taken as an elective study at an earlier period. The laboratory work is best given in double periods. Two double periods per week for the laboratory work, and three single periods for recitation and lecture extending throughout the year (one hundred and sixty-two hours in all) are suggested as a fair arrangement and one in accord with the best usage at present. Perhaps in the best equipped schools the course could be extended, and part of the course made optional, since "*the value of any study depends largely upon the reaction of the student.*"

The Equipment of the Teacher.—In selecting a teacher even for so technical a subject as chemistry the personality of the teacher counts for more than his knowledge. Granting suitable personality in the teacher, the more technical knowledge, skill, and experience he has the better, *ad infinitum*, and *equally as important is the ability to teach*. Highly specialized training in a particular subject, such as chemistry, of itself probably neither gives nor destroys the ability to teach. There is little more to be said. In any given case the selection of a teacher narrows itself down to a consideration of the special fitness of particular individuals. Rigid economy in the salaries offered results inevitably in the long run in a sacrifice of efficiency.

Colleges, universities, and normal schools can well give more attention to equipping the future teachers of

chemistry to meet the difficulties incident to the installation of efficient laboratory instruction.

Text-Books and Reference Books.—A text-book should be chosen with reference both to the *teacher* and to the *pupil*. The text-books differ not only as regards style, clearness, and amount of subject-matter introduced, but, also, they vary greatly in the emphasis placed on the descriptive side of chemistry (the facts) as opposed to the generalizations (the theories and laws) underlying the facts. Also they vary in the emphasis placed on the scientific as opposed to the practical side of chemistry. Let teachers note these differences and select a book suitable for their purpose. If the text-book adopted does not sufficiently emphasize the practical side of chemistry, the teacher should not hesitate to draw material for an occasional lesson from the reference books at hand.

CHAPTER IX

BIOLOGY

ARTHUR S. PEARSE, PH.D.

FORMERLY ASSISTANT PROFESSOR OF ZOOLOGY, UNIVERSITY OF MICHIGAN;
ASSOCIATE PROFESSOR OF BIOLOGY, ST. LOUIS UNIVERSITY
SCHOOL OF MEDICINE

"The student of nature can do no more than strive toward the truth. When he does not find the whole truth there is but one gospel for his salvation—still to strive toward the truth. . . . And so, if you ask whether I look to a day when we shall know the whole truth in regard to organic mechanism and organic evolution, I answer: No! But let us go forward."—*Wilson*.

"A good teacher is one who puts the least possible obstruction in the way of a student."—*Coulter*.

Introductory—Importance of Biology.—The study of biology is of particular importance in education since our entire store of knowledge has its basis in the activities of living substance. All the conditions which human beings most desire to attain represent the fulfilment of biological laws. The youth hungers for maturity—he is completing his life cycle; the man spends long days and sleepless nights striving to attain success—this is his endeavor to survive in the struggle for existence; the mother longs for a child and, once she has one, will sacrifice all else to it—thus is the race preserved. Love, hate, industry, knowledge, power, success are all conditioned by nutrition, growth, excretion, oxidation, and other processes which are common not only to all animals but to plants as well. Small wonder, then, that educators have lately

found a place for biology in the high school curriculum and that it has steadily gained ground.

For those who still question the value of biology, it is easy to find answers. From the point of view of mental training, the proper study of living things offers an excellent field for (1) gathering first-hand knowledge, (2) gaining clear ideas, (3) making concrete analyses, (4) using the mind for abstraction and discrimination, (5) seeing resemblances, (6) forming general concepts, and (7) giving logical definitions. Furthermore, "biology has a special function in training, in that it has for its subject-matter living organisms whose varying and uncertain behavior train the judgment of youth better to understand the behavior of men. It certainly exercises the judgment in a different way than do the exact sciences of physics and chemistry." The æsthetic sense is cultivated so that a finer appreciation of the grandeur and beauty of the living universe is gained without the sentimentality and superstition which have often been characteristic of lovers of nature.

For the practical mind a host of instances might be cited wherein biology is of inestimable value to man. The study of the biology of such afflictions as malaria, yellow-fever, and the hook-worm disease has revolutionized our ideas, and we are amazed when we look back on the methods formerly used in the treatment of such diseases. According to authoritative estimates, more than four hundred million dollars are lost annually in the United States through the ravages of insects, and it seems fitting that our high school students should have some general notions concerning them. Fifteen per cent of the hogs in certain localities are infected with the dread trichina. Should we not learn how this comes about?

As long ago as 1897, fifteen hundred persons were employed in making pearl buttons from clam-shells in the State of Iowa. Should not young men in such a locality have a chance to learn something about clams? And so on *ad infinitum*.

But biology has still other spheres of influence. The social life of any boy or girl who studies it will take on a newer and broader aspect, by gaining a proper perspective of man's place in nature. In some respects man excels all other organisms, in others he is inferior to some of the so-called lower animals; at all events, he is only an animal and is subject to the same biological laws as others. And finally, no person who has once grasped the fundamental principles of biology can fail to see that his whole mental and moral nature depends upon the proper cultivation of his body (particularly his brain cells); consequently, biological knowledge ought to be a daily incentive to a clean, moderate, and worthy manhood.

Historical.—Although the scientific study of biology dates from the time of Aristotle, it was not given a place in the school curriculum before Pestalozzi. In the United States biology made its way into the secondary schools during the nineteenth century. For the first quarter of the century no zoology was taught. Botany, being deemed more elegant and precise, was offered in a few "female seminaries." From 1825 until about 1875 zoology and botany were taught from text-books with the chief emphasis on the systematic side—the central idea being to inspire students with admiration for the works of the Creator. About 1875 comparative anatomy began to be introduced into zoology classes, and students were first required to verify descriptions by reference to dissections and demonstrations, and later to

make dissections for themselves; on the botanical side, work outside the text-book was largely confined to the preparation of herbaria.

Rapid advances in high school biology have come within the past twenty-five years. Since 1885 effective laboratory work has been more generally present in the better schools. Before this time biology was "not yet recognized as one of the essential factors of education"; the common facts relating to the subject were not widely known, and there were neither competent teachers nor acceptable text-books. Furthermore, the subject was not generally supposed to furnish a broad scope for mental discipline.

In 1892 the "Committee of Ten" recommended that a minimum of biological instruction should be one year, preferably devoted to either botany or zoology, with daily recitations. By 1895 biology had come to be recognized as valuable and important. At this time botany was still preferred to zoology for three reasons: (1) It was supposed to be better fitted for the child's tastes and uses, (2) more high school teachers were prepared in botany, and (3) it was demanded as a college entrance requirement.

During the past ten years there has been a strong reaction against the old stereotyped conception which made of botany and zoology simply a mental exercise in classification and morphology. In 1903 Miss Brown said: "The laboratory method itself, which has lived now upwards of fifteen years, has not come through unchanged. From verification it has passed to investigation. It has become more flexible and more readily adapts itself to varying conditions. The day of laboratory guides is passing, but in its place is coming dynamic

work, entailing greater attention to physiology and function." Thus our methods of presentation have passed from narrative to classification, from classification to morphology, and we are now "entering upon a new phase which may be called investigation."¹

Correlated with the change in methods of teaching have been changes in the various accessories to such instruction. During the past twenty-five years such complicated and expensive pieces of apparatus as the compound microscope, the camera, the clinostat, and the projection lantern have come into general use. We have advanced from the detailed one-sided descriptive text-books of the older writers, to comprehensive modern works, like those of Bergen and Davis, Coulter, Jordan, Kellogg and Heath, Linville and Kelly, and Hunter, which can be read and understood by high school students, but which nevertheless give some adequate idea of the present status of botanical and zoological thought.

Hunter gives a convincing statement of the growing recognition of the educational value of biology in this country. He has gathered statistics from 276 representative high schools distributed through 34 States. Of the 1,371 science courses given, 430 were biological (623 if physiology courses were included). Hunter says: "430 courses in biologic science are given as against 166 courses in physiography, 253 courses in chemistry, and 268 courses in physics."²

Ideas concerning the educational value of biological studies have been modified during the past few years. Biology first gained its place in the high school curriculum on account of the facts it presented. The dissection

¹ *School Science and Mathematics*, vol. II, pp. 201-209, 256-264.

² *School Science and Mathematics*, vol. X, pp. 1-10, 103-110.

and classification of types was for a time made an end in itself, but it soon came to be recognized that biology was a valuable means for training in observation. But even at this stage, the subject was often mere drudgery in the hands of mediocre teachers, for the aim was to "cover" a certain number of "forms" with due regard to accuracy in observation. The best teachers soon saw opportunities for improvement. The chief fault with the method was that the questions for which the laboratory guides required solutions could be answered by mere observation, and the student was not encouraged to think. Thus, the training, though good, was not in thinking, but in more or less mechanical processes, such as the making of diagrammatic drawings, and memorizing classifications and the structural details pertaining to certain types. One of the leading high school teachers of the Eastern United States describes the conditions in the following words: "Before the crisis came, however, we developed the belief that we could get more than mere observation from the pupil. We could get him to think and to form judgments. . . . We know that the method of experimentation, the so-called scientific method, is the process by which the great truths of science have been worked out. Some teachers are beginning to use the methods in work in biology in the schools, not for the purpose of developing specialists in research, but for the purpose of showing the pupils how problems may arise, how to formulate problems for themselves, how the factors of a problem are analyzed, how the conditions of experiment must be controlled, what results are, and that conclusions must be based on results." ¹

¹ Linville, H. R., "The Practical Use of Biology," *School Science and Mathematics*, vol. IX, pp. 121-130.

The idea that biology may offer all that it has included heretofore, and at the same time give students mental training by presenting problems for solution, has been stimulating for both teachers and pupils, and gives the greatest promise for future advancement.

Present Status of High School Biology.—The correlation between the different branches of science is gradually becoming closer, and it is to be hoped that the time is not far distant when a plan may be adopted for the sciences which will be as well organized as those now followed by high school teachers of language or mathematics. "Schools offering biologic science early in the course with physics and chemistry later, after considerable mathematics, report almost uniformly satisfactory conditions. There is, however, considerable diversity of opinion as to the place of physiography. We may . . . divide the schools into two groups, one giving physiography in the first year followed by biology in the second year, and those giving biologic science in the first year followed by physiography."¹ Except in some Eastern States, biology is usually given in the second year, and there are many reasons why this seems to be the best plan, though there are, of course, some arguments against it.

Although the sequence in high school science is becoming better co-ordinated, the same cannot be said of the particular field of biology. Miss Dawson justly criticises the present system and gives a very pointed illustration. She visited a college, a normal school, and a high school on the same day, and found all the classes studying the same animal in much the same way.² Some

¹ Hunter, G. W., *School Science and Mathematics*, vol. X, pp. 1-10, 103-110.

² Dawson, J., *School Science and Mathematics*, vol. IX, pp. 653-657.

of the work now given in high schools has been copied from universities, and there is much duplication. However, there is a sentiment for courses especially adapted to the needs of high school students without reference to anything else; in fact, many high schools are giving such courses at the present time. Nevertheless, the great question to-day is not the value or fitness of biological study, but what to teach.

Whitney¹ has pointed out that the time allowed in our limited curriculums is not adequate for the proper presentation of scientific subjects, and there is little correlation between them. The time must come when educators cannot avoid giving a more important place to science on account of its close relation to thinking, living, and many practical problems. The student in the future will get mental training from his science similar to that which he now receives from other subjects, which often have little else than their so-called disciplinary value to commend them. This will not come in ten years, perhaps not in twenty; it must be a matter of growth and the biology teachers will have to lead the way. When the instruction in high school biology is as well organized as that in Latin (without preparation before the high school) or mathematics (preceded by excellent training in the grades) those in authority will not question the wisdom or value of two or even three or four year programmes for instruction in the subject.

At the present time little is done in the way of organized nature study before the high school. About half the leading high school systems in this country attempt to carry on such work to some extent, and the proportion is much less in the smaller towns. It seems probable that

¹ *School Science and Mathematics*, vol. X, pp. 369-381.

the study of nature will become more and more prevalent in the grades, but at the present time it is not usually of enough importance to afford any sort of a basis for biological instruction in the high school.

If we turn to the school journals of our day for light on the present status of the high school biology curriculum, we find great diversity of opinion. There are advocates for one year biology courses, one year botany or zoology courses, agriculture, hygiene, ecology, physiology, economic biology, type study, classification, field-work, home work, museum work, and various other phases of biological instruction. The time actually devoted to biology varies from one or two hours per week for half a year (in some places in the South) to as much as ten hours per week for ten months. Little progress will result from the agitation of such topics as the order of type study, how much the microscope should be used, or how much time should be spent in the field, or laboratory, or in the study of a text-book. These are details which should be left to the discretion of the teacher. In the opinion of the writer, the most hopeful sign for the future is the fact that two of the foremost high school biology teachers in the United States, Walter¹ and Linville,² have recently advocated courses based, not on classification nor a study of types, nor even on strict botany or zoology, but on *ideas*.

Biology is confronted with two important problems in the high school; (1) it has more ground to cover than is possible in the allotted time, and (2) it is sometimes obliged to compete with its own subsiences, like agri-

¹ Walter, H. E., "An Ideal Course in Biology for the High School," *School Science and Mathematics*, vol. IX, pp. 717-724, 840-847.

² Linville, H. R., "Old and New Ideas in Biology Teaching," *School Science and Mathematics*, vol. X, pp. 210-216.

culture and physiology, and with such subjects as manual training and domestic science. Until adequate time is allowed, biology must present general principles or lose students through competition. This does not mean that high school students should study nothing but general ideas; in fact, it is better to make the major part of the work concrete, but exercises should be selected to illustrate general facts, and presented so that students will receive such training that they can apply the knowledge they gain after they are out of school. The idea of generalization will meet with opposition from many teachers who have emphasized one side of biology for several years, and from those whose training has been narrow; but the writer sees no objection to selecting certain general principles which biologists might agree to teach in every high school in the United States, and which might form a basis for various courses in which the emphasis was placed on agriculture, human physiology, forestry, fisheries, or anything else that was important in a particular community.

The time was when high school teachers knew so little that they were the slaves of tradition and authority, but at the present time most of them are able to think for themselves. There are many places in the United States where the very best work is being done by teachers who are able to adjust the great truths of biology to the animals and plants in their vicinity, and to the students in their school. The writer takes the liberty of grouping biology teachers (without regard to their training) into four classes: (1) Those who assign lessons and conduct recitations; (2) those who not only require good recitations but also conduct acceptable laboratory work by the use of a manual; (3) those who combine laboratory and recitation work with field excursions and individual

outside work by students, and (4) those who do all the things mentioned under (3) and also make their work a constant study, attempting to correlate their own knowledge and training with local conditions and new ideas in such a way that their students get the maximum amount of good.

Obstacles to Successful Biology Teaching.—Probably the chief factor which has operated to inhibit progress in biological instruction has been respect for authority and tradition on the part of teachers. The limited training formerly offered them gave no broad background of knowledge on which to draw for instruction. This resulted in narrow biology courses copied from those in universities. There has been a lack of willingness on the part of teachers to study the common things in their vicinity with their classes because they knew nothing about them. Hence, students have been obliged to grind over the matter their teacher learned in college, or to use a manual written by some college professor or some one who held to college methods and ideals. The colleges and universities have hindered, rather than helped, the high schools in this matter. Instead of allowing the high schools to work out a plan for their own salvation, colleges have often tied them down by arbitrary entrance requirements which compelled students to study certain types or phases of biological science to the exclusion of others. Furthermore, traditions have been fostered so long by some college departments that most high schools do not now give full credit for certain subjects unless two full years have been devoted to the study. Nothing but tradition permits carefully worked out detailed courses, which have little value to the majority of students except the training they give, to dominate the high school cur-

riculum to such an extent that other more practical subjects with equal training value are slighted.

There has been a lack of good biology teachers, and the demand even now far exceeds the supply. Adequate training is of course necessary; some of the larger cities have recently gone so far as to require a master's or even a doctor's degree. The writer feels that four years of college work ought to suffice to train a biology teacher, if it is properly directed with emphasis in particular fields, and if the teacher takes measures to insure his own growth after graduation. A college student preparing to teach biology ought to take courses covering (1) the general principles of classification, morphology, physiology, ecology, geographical distribution, and evolution; (2) practical methods of teaching; (3) detailed knowledge of a number of types; (4) general knowledge concerning certain topics, such as the history of biology and biological thought, and (5) general courses in physics, chemistry, geology, and psychology. But the lack of good teachers has not been altogether due to improper training nor to the limitations imposed on those who undertook such work; low salaries have kept many good teachers from pedagogical pursuits, and many have quit teaching for more remunerative occupations. However, no one gets more than he is worth in this world, and when our teaching is realized to be of practical value by practical people, the teacher will still get less than he is worth, but he will get more than he does now. The writer believes that the remedy lies in educating the teacher as well as the general public.

Much poor teaching of biology has been done. There has often been a lack of adaptation to high school minds that has led from an absence of interest to careless work,

and sometimes to barefaced cheating and dishonesty. Teaching has often become a mere routine (dissect, observe, draw) applied to one subject after another without any regard to the general bearing of such studies or to their practical application. A fault related to this has been that teachers have often made no distinction between intensive and extensive work. Careless methods have also been fostered because students were required to make detailed notes or drawings which the teacher did not correct. A good teacher will so arrange his course that, without undue drudgery on his part, notes and drawings can be examined, and the student be made to feel that everything he does is to be checked.

Cheating is often a difficult problem for the biology teacher, and his methods often place a premium on it. It is of course difficult, even if it is desirable, to prevent the best student at a laboratory table from setting a standard for his fellows, who often copy without intending to do so; but the matter frequently goes farther. Two methods have been commonly used to secure independent work from students: (1) The work accomplished each day is handed to the teacher for correction at the end of the period; (2) students at the same table work on different plants or animals at the same time. The first method prevents copying while students are not under the supervision of the teacher; the second helps to keep students who work together from dividing up the work or helping each other. If one boy works out the anatomy of an insect from a beetle, while the boy next him uses a grasshopper and the girl across the table studies a bee with the same end in view, comparison and discussion are highly desirable.

The greatest needs of high school biology at the present

time are: (1) More well trained teachers; (2) more freedom for teachers to adapt their subject to the students, the community, and their own limitations; (3) more time, but not necessarily more specialized courses; (4) better stratification in the educational system (*i. e.*, better sequence in science so that repetition is avoided); (5) more willingness on the part of teachers and educators generally to study conditions with the idea of doing the student the most good.

CHAPTER X

PHYSIOGRAPHY

WILLIAM J. SUTHERLAND, M.A.

PRESIDENT STATE NORMAL SCHOOL, PLATTEVILLE, WISCONSIN

What Physiography Is.—Whenever the mature mind considers any phase of earth phenomena, its spirit of inquiry looks for explanations. The causal element must be conceived before any phenomenon can be fully understood. This rational element is a characteristic of the new geography and is the essence of that specialized department known as physical geography or physiography.

A study of physical environment, without reference to its fitness as a habitat, is pure physiography. A study of the life of the earth, quite apart from its envioning conditions, is anatomy or morphology. Modern methods in biology consider life with reference to environment. So *general* geography is concerned with both of these departments of science, which Professor Davis has denominated the “physiographic” and “ontographic” relationships. Physiography may be termed the rational phase of general geography.

As its name implies, physiography¹ is the study of physical science as manifested in earth phenomena. It is the study of earth-physics. A gorge is observed to exist be-

¹ In this discussion physiography and physical geography are considered identical in nature; the latter designates a more elementary treatment.

low the falls of a stream. The inquiring mind seeks to satisfy its curiosity through the discovery of the causes. The relative positions of hard and soft strata are discovered, and the reaction of the falling water noted. Other gorges and falls are examined; their features are compared with the first, and a conclusion relative to the philosophy of waterfalls is finally reached. Such, then, is a study in pure earth-science.

It is sometimes charged that physiography is not itself a fundamental science; that it borrows its subject-matter from the other natural sciences, and that it is therefore conglomerate in nature, and hence unscientific. It is true that facts common to physics, chemistry, meteorology, geology, astronomy, etc., are employed also in physiography, but such use does not make the charge valid. How much chemistry is involved in the study of voltaic electricity, in the production of starch in green plants, and in the maintenance of temperature in animal bodies! Do not all of the specialized sciences overlap at some points? Who can draw the line of demarcation between related sciences, *e. g.*, between botany and zoology? The ultimate test of scientific character is not more concerned with the materials of a subject than with the *use it makes* of them. The masters of earth-science have organized and unified its somewhat diversified materials into an intellectual structure quite as circumscribed and significant, quite as theoretical and functional, as is botany or physics or agriculture. One who fully comprehends the interaction of processes which determines the "cycle" in earth-science, has reached a point where he can make a mental survey of the nicely articulated materials that contribute to the systematization of the subject. Its understanding requires a knowledge of the

physiographic processes—diastrophism, gradation, and vulcanism—whose adequate elaboration¹ builds up the *science* of physical geography or physiography.

New Methods of Study and Teaching.—Prior to the recognition of the rational element of geography and the adoption of a physiographic basis, general geography was presented in a highly empirical or dogmatic manner. The new geography was really ushered in through the establishment of the old geography upon a physiographic basis.

Changed conceptions of education have engendered a critical attitude toward subject-matter values. Every subject must now submit to searching evaluation. The growing opinion is that science instruction should be concrete. Applied science is at a premium in secondary schools. The intrinsic and specific values of physical geography have been demonstrated.

"Education and Life" is the popular slogan. The test of subject-matter units is their fitness to function in life. Hence the effects of earth features and processes are highly important. A waterfall is studied not more to determine the philosophy of its own existence than to discover and comprehend its influence on industries and the distribution of population. General geography is regarded as the study of relationships that obtain between the inorganic and organic worlds, between controls and responses. Now these controls,² or conditions, are physiographic in nature and, taken together, constitute the content of physical geography. They are to be studied not as ends in themselves but as the governing conditions or controlling factors of physical environment.

¹ See "Physical Geography," Dryer, Chas. R., p. 241.

² See "Geographical Essays," Davis, W. M., chap. II; also "The Teaching of Geography," Sutherland, William J., chap. II.

It is evident that the nature and content of physiography must endow it with liberal, vitalizing, and theoretical values. In scores of instances it explains phenomena. It is observed, *e. g.*, that a continental margin abounds in good harbors. Scientific investigations reveal the facts that subsidence has occurred, that the lower river valleys have been drowned, and that good harbors and protected havens are the results. General geography would continue the logical sequence and note the effect of good harbors upon commerce, the growth of commercial centres, and the development of natural resources in the surrounding country. It is the rational element of *physical geography* that explains and vitalizes geographical facts that otherwise would be abstract and dogmatic. Eliminate this element, and geography at once falls back into the empiricism of its early history.

To summarize:

(a) The essential element in the study of earth-science is that of relationship.

(b) There are two approaches to the study of earth relationships, viz., the organic or life side, and the inorganic or physical side.

(c) General geography is the study of physical controls and life responses, not in a specialized form, but *as* earth relationships.

(d) Physiography is the study of physical environment. It is the physical approach to earth relationships.

The chief function of physiography is that of adjusting the individual to his physical environment. This adjustment is at once practical and theoretical. It is practical in that every life form or industry is earth-determined in some particular, and theoretical in the

sense that a knowledge of the relationships with which the subject so largely deals is necessary to any well organized intellectual structure.

All life is characterized by its environment. Savage and barbarous peoples adjust themselves almost wholly to their unmodified surroundings. Civilization is measured by its ability to modify and adjust nature to its more ideal uses. The increase in population and consequent drain upon natural resources make imperative finer and more intelligent readjustments of earth and earth products for the purpose of satisfying the needs of mankind. National progress depends upon an understanding of earth conditions—upon geography. But earth conditions are comprehended largely through physical geography, *e. g.*, when waterfalls determine the locations of factories and cities; when limestone and phosphate rocks attract a dense population to rich farm lands; or when overhanging mountains temper the climate and determine the rainfall of adjacent plains.

The utilization of natural resources is directly economic and indirectly social. The English landlords fought for the retention of the Corn Laws because these measures protected their wheat from foreign competition. The manufacturers sought to repeal them because cheaper and better food meant greater efficiency on the part of their laborers. Hence farm lands, mines, and raw cotton are translated into social conditions, and even into laws.

The Change in Text-Books.—The early text-books in physical geography were unorganized and scrappy. They were too inclusive and their treatment of topics was unpurposeful. They were written to be learned, the style being dogmatic and sometimes catechetical. The illus-

trations were ideal—made to order—and the consequent tendency of these texts was that of projecting the pupil's thought into some hazy distance. More fundamental in their weakness was the almost entire lack of theoretical conception. The subject seemed to have been thrown together for the purpose of building up a reference book rather than for any well conceived ulterior motive.

With the advent of the new geography there has evolved a new order of text-books. And these books are nearly everything that the others were not. Scientific, concrete, and rational, they incorporate only materials that will relate the individual most advantageously to his physical environment. Scholars have conceived of environment as dynamic, stimulating, and controlling life forms, and they therefore have abandoned the passive, teleological scheme of the earth as a predestined and sufficient habitat. Our modern texts have selected their materials so wisely, and with scientific spirit have elaborated and articulated them so well, that unity and method are insured.

The Change in Method of Presentation.—In method of presentation the old empirical¹ procedure has been made to yield to an inductive, observational, and problematical² treatment. Manuals have been prepared to supplement regular texts that have not incorporated suitable problems and exercises. And constant reference to the *earth itself*, together with the vitalization that comes through the employment of wisely selected half-tones, tends to cultivate the true spirit of earth relationship.

Material Equipment.—Geographical laboratories are still so uncommon that many teachers have never seen a good one. But they are becoming more common and

¹ Empirical in the sense of dogmatic.

² Presenting problems for solution."

there are some good ones. Serviceable apparatus¹ has been adapted to work in physiography. Mapping, modelling, graphing, observing, interpreting, verifying, and recording are daily exercises in well-equipped laboratories.²

Educational Value of Physiography.—The educational value of physiography is never questioned by those who have been close students of the subject. Its contribution to educational development certainly *can* be questioned when its teaching is committed to the hands of unprepared teachers—as so frequently happens—and when no adequate equipment has been provided. Physics, chemistry, biology, and manual training now command reasonable material advantages for the insurance of satisfactory results. Physical geography, when properly handled, readily proves its worth. From either the point of view of pure science or applied science, the subject seems to be rich in educative value. Pure science seeks to discover the truth for truth's sake. But truth, when discovered or apprehended, must be referred to proper categories and rendered scientific through method. It has been found that earth-science yields to scientific method quite as readily as do physics, chemistry, and

¹ The following pieces of apparatus are considered necessary to a well-equipped laboratory: Mercurial and self-recording barometer; aneroid barometer; hygrometer and thermometers; self-recording and maximum and minimum thermometer; sun-board (Goode's) or helior; clinometer compass; plane table and alidade; rain gauge; anemometer; large globe; supply of small globes; collections of rocks and minerals; suitable laboratory tables; models (the Harvard Geographical Models) and modelling tables; maps, charts, pictures, and stereopticon; a good supply of United States Geological Survey maps, weather maps, coast charts, pilot charts, etc.

² For suggestions, see "Practical Exercises in Elementary Meteorology," Ward, Robert DeC., Appendix B; also "The Equipment of a Geographical Laboratory," Davis, W. M., *Journal of School Geography*, May, 1898.

botany. Again it is quite likely that those who advocate "science for science's sake" also recognize values of discipline. Viewed in this light, physical geography certainly ranks well with other physical sciences in genuine educational value. Professor W. M. Davis has developed model exercises that well illustrate scientific method.¹

Place in the Curriculum.—An evaluation of physical geography as *applied* science makes the justification of its place in the secondary curriculum still easier. Our newer psychology and pedagogy place a premium on subject-matter that promises to function in life. Physical geography is the study of physical environment, and hence it touches life directly. Viewed in this light, it seeks not only to understand observed phenomena but to comprehend their effect upon life. It so occurs that we become less interested in the form and structure of mountains, and more concerned with their effect or influence on winds, temperature, and rainfall. It seems, further, that this view vitalizes the subject of discussion. Geography is dignified—even exalted—when this larger conception is gained. For example, in connection with the heavy precipitation in the Puget Sound region, its effect upon the development of forests, upon the relatively high winter temperature, and upon the needs and customs of the people who live in this region, should be considered.

It has been urged that physical geography performs an important educational function, either as an introductory or a correlative science. These ideas have had much to do in assigning it its particular place in the curriculum. Usually it is taught in the freshman year, the argument being that it is related closely to the biological and physical sciences, and that its study results

¹ "Geographical Essays," Davis, W. M., chaps. X and XI.

in the establishment of an apperceptive system from which an easy transition can be made to the other specialized sciences. The fact that physical geography has not been included in the list required for college entrance has worked to its disadvantage. Teachers quite unprepared to deal with the subject, inadequate equipments, and an odd hour, have been assigned to physical geography. Is it not evident that those in charge have attributed little value to the subject, except perhaps as a sort of general forerunner of the other high school sciences which, owing to the immaturity of freshmen, are reserved for the later years of the course?

Physical geography and physiography differ only in degree of difficultness. Physiography was recommended for the senior year of the high school by the "Committee of Ten." The conception that led to this recommendation was that physiography would serve an important function in correlating the other sciences of the course. The committee realized also that it was a strong study and required some maturity of mind.

Earth-Science an Inspiring Subject.—A criticism can be passed on either of the views just cited inasmuch as they seek to justify the study of earth-science—either as physical geography or physiography—on a theoretical basis. That is, earth-science may serve to introduce or correlate other subjects, and hence the inference that it does not possess specific and intrinsic values. When well taught, earth-science is a rich and inspiring subject. It possesses in a high degree practical and cultural worth. The writer does not care to measure the value of any subject on the questionable basis of disciplinary power, though even on this basis its strong rational element would give physiography high rank. Through its varied

relationships, it is endowed with functions, complementary and illuminating, which contribute much to the building up of stable and symmetrical science units.

The vacillating attitude that is often manifested toward physiography as a worthy secondary subject, is seeking explanation. Leading educators attribute the indifference to the fact that the subject has figured but little in college entrance.¹ It does not follow, however, that, because a subject has long been recognized for college entrance, it is paramount in educational value. Subjects are withheld in this connection on traditional grounds, and because of their definite, formal, and theoretical values. "The sooner colleges give up the idea of controlling high school courses, the better it will be for the colleges," says a leading educator and geographer. It may be added that if, irrespective of all articulating systems, high school supervisors would equip and man departments of earth-science, and give the instruction as fair an opportunity to succeed as is now given other science subjects, it would not be long before this subject gained general recognition for its inherent interest and its practical worth.

Improvement in Method of Presentation.—In method of geographical presentation, great improvement has been made during the past fifteen years. Teachers now *specialize* in geography and, along with specialization, method develops. By method the writer has not in mind mere pedagogical method or class-room device, but that deeper method which is the outgrowth of a profound

¹ See "Physiography in the High School," Salisbury, R. D., *Journal of Geography*, November, 1910; also "Problems in the Teaching of Physical Geography in Secondary Schools," Fenneman, N. M., *Journal of Geography*, March, 1909.

study of subject-matter itself. As has been stated elsewhere, general method in geography, and also in physiography as designed for secondary schools, is the resultant of three components, viz.,

- (a) The intrinsic nature of the subject.
- (b) The needs of the individual in his life relationships.
- (c) The educative process through which the pupil comes into possession of these relationships.

Since our recent geographical renaissance, marked progress has been made in:

(a) The delimitation of the field of physiography, making it more definite and coherent.

(b) The infusion of an acceptable earth-philosophy into the selected subject-matter, thereby contributing to its significance and substance.

(c) The articulation of the subject-matter units yielding a well-organized science.

(d) The substitution for the old empirical¹ and descriptive method of one that is concrete, inductive, and problematical.

(e) The subordination of mere data and the accentuation of far-reaching principles.²

The examination of our best courses in physiography warrants the statement that they are quite as definite as are courses in other high-school sciences.³ Space does not permit full discussion or illustration of method, but in general it may be said that the approved method sets a problem for solution; it guides the pupil in observing phenomena and selecting data either in the laboratory or

¹ Dogmatic.

² For commercial reasons text-books do not always represent the best thought of our leading teachers.

³ See "Manual of Physical Geography," Emerson, Frederick Valentine.

in the field; it necessitates the "working-over" of the concrete data and the formulation of a general principle. With mature high school pupils the generalization may involve hypotheses which are tested carefully under the teacher's guidance, and one after another discarded until one is found that seems to satisfy the conditions imposed by the data. The generalization made, the pupils are now assigned new problems of a deductive nature in which, through field or laboratory work, new individual instances are brought under the general rule. This problem requires the securing of data, the recalling of the principle, the making and verification of the inference.¹

The grade of work just suggested should not be attempted before the junior or senior year of the high school.² It seems very unlikely that two courses—one preliminary and one advanced—will ever be recognized in secondary education. It is recommended, therefore, that physiography be given in the senior year. If the geography of the elementary school be given a strong physiographic setting, if excursions and field trips are made to establish some definite notions, and if this preparation be supplemented by the study of physics, chemistry, and biology in the high school, pupils of senior standing will be able to do a fairly representative course in physiography.

The recognition accorded earth-science in secondary education has already been hinted. It is usually taught in the freshman year, but with such poor provisions that it is quite unfair to pass judgment upon its educational

¹ See "The Teaching of Geography," Sutherland, William J., p. 156.

² If physiography *must* be taught in the *freshman* year, the same general plan should be adhered to, the work being made somewhat easier.

returns. Just what the future may bring is hard to predict. But with the present tendency in favor of applied science, with the strong endeavor to close the gap between education and life, and with the evolution of scientific and functional courses in physiography, the coming years would seem to augur well.

Need for Well-Prepared Teachers.—The great need at present is for properly prepared teachers. Respect for physiography will increase when it is more effectively presented, for then its educational value will become more apparent. That there is a growing interest in this field of study is evidenced by the development of departments of geography in our leading institutions. Harvard, Columbia, Cornell, and Chicago universities maintain departments to which the country at large is indebted for incentive and guidance.

Preparation of Teacher.—The deficiency of geography teachers is mainly on the academic side. An adequate preparation to teach physiography demands considerable knowledge of physics, chemistry, meteorology, geology, biology, etc., all of which should be worked over with special reference to this particular subject. A "feeling for the subject is indispensable to success in any high degree," says Professor Salisbury, and this attitude comes only through prolonged and earnest study of earth phenomena.

Presupposing a reasonable professional attitude, the high-school physiography teacher's preparation¹ should include:

(a) A knowledge of the physiographic processes which explain our varied environmental conditions.

¹ See "New Basis of Geography," Redway, J. W., chap. XII; also "The Teaching of Geography," Sutherland, William J., chap. IX.

(b) A knowledge of physiographic features and regions that gives the teacher a reasonable acquaintance with the world and enables him to illustrate readily.

(c) A familiarity with the best books, periodicals, government publications and other sources of information, and an acquired skill in their use.

(d) The ability to use the hands well in performing experiments, drawing, and modelling.

(e) A thorough knowledge of maps, especially the United States Geological Survey maps, atlases, and folios, with an appreciation of their worth in teaching.

(f) A well-organized knowledge of general geography, such as will contribute those biological, economic, and social responses necessary to make pure physiography significant.

(g) A love of nature and some ability in interpreting earth features on both large and small scales.

(h) And lastly, an evolutionary or scientific conception of earth and life, that unifies and enriches geographical facts and inspires the appreciation of man.

Promise of Future Progress.—There seem to be no valid psychological reasons or practical difficulties that should retard the higher development and more general recognition of worthy courses in physiography in American schools, comparable to the work in German and English schools. The changing conceptions of education and educational values seem to give promise of future progress in earth-science. The general awakening to its possibilities will encourage geographical study and continue to demonstrate the value and function of physiography as a secondary subject.

CHAPTER XI

ENGLISH

JOSEPH VILLIERS DENNEY, A.M.

DEAN OF THE COLLEGE OF ARTS, PHILOSOPHY, AND SCIENCE, AND
PROFESSOR OF ENGLISH, OHIO STATE UNIVERSITY

Triumph of Democratic Spirit in Education.—The most impressive fact in the educational movement of the last forty years is the triumph of the democratic spirit. This spirit expresses a conviction that at the proper time and in due course, every young American shall have free access to every kind of knowledge and discipline that is suited to his needs, tastes, and ambitions. Hence, to an extent hardly dreamed of as possible two generations ago, science, political ideas, literature, and the arts, both fine and useful, have come into the secondary programme of studies. Much of this new spirit has centred in the study of English, since English culture expresses the social level of the community and of the individual citizen.¹ Studied as a tool for mastery, English contributes to social efficiency. Studied as a fine art, it reveals the laws of all the arts which are also the laws of living. Studied as a body of literature, it reveals in beautiful forms the ideals—patriotic, social, domestic, religious—which the race has cherished in the past and which democracy needs now

¹ Baker, G. F., "Address on English," Washington, D. C., December, 1902.

more than ever before.¹ The various purposes of the study as usually stated—(1) to enable people to understand the expressed thought of others, (2) to enable people to express their own thoughts effectively, (3) to cultivate appreciation of good literature²—all point to one unifying purpose—the creation of universal intelligibility, on high levels of thought, among the multitudes who are to be self-governing.

Unifying Principle of Method.—This comprehensive and unifying purpose in the different English disciplines is matched by a unifying principle of method that has been supplied by psychology.³ Certain activities of mind that English study calls into play prove to be constants; they are the same (though in varying degrees and proportions) for all kinds of work with the mother tongue. They are alike essential to reading, spelling, grammar, composition.

Four Things Necessary in Reading.—In order really to read, what must take place? First of all, there must be observation; the reader must look until he sees—sees the thought of sentence, paragraph, chapter, book—in its entirety. The thought is one thing and reading is a sensing of this one thing. Observation must continue, therefore, until there is perception of the thought. Secondly, the learner must discriminate; he must observe until he can select between important and unimportant, between subject and predication, between principal and modifier, and he must be able to pick out these things. Thirdly, he must take subject and predication out of the mass of modifying elements and must con-

¹ McMurry, C. A., "Special Method in English Classics."

² "Report of Committee of Ten," p. 86.

³ Lewes, "Principles of Success in Literature."

template them by themselves in order to test the truth of the statement they make; and if he finds that they make an incongruous assertion, he must observe them anew in their original setting in order to get them right. Lastly, he must be able to restate the thought in terms of his own experience.

Spelling and Grammar.—The same activities are called into play in learning to spell. The trouble with most poor spellers is that they will not look long enough to see, or, if they are ear-spellers, will not listen attentively enough to hear; will not select the particular difficulty of a troublesome word for special attention; will not, finally, make the recombination test in other words involving the same difficulty. In parsing there must be, likewise, the scrutiny of the sentence until it divides itself into subject and predicate, into phrases and clauses standing in certain relations; then the choice and abstraction of the particular construction undergoing study, and, finally, the recombination of this construction in an original sentence.

Original Composition.—Pre-eminently in original composition, however elementary or advanced, there must be observation or study up to the point of perception or insight; there must be the choice of things to say and of things to omit, in view of the purpose in writing; there must be the abstraction of the things selected in order that they may be contemplated by themselves, and, if necessary, supplemented by a new observation; and there must be the recombination, the writing or speaking of the whole. Original composition, however, makes far greater demands upon these activities than do spelling, reading, and grammar. For in original composition, the observation, selection, abstraction, recombination, must be first-hand, whereas, in the others, there

need be only a rediscovery and reproduction of the results of these activities in the final work of others.¹

The Constructive Imagination.—Now these activities that underlie all work with English are what the modern psychologist means when he speaks of “the constructive imagination.” They suggest a fundamental methodology for English instruction. More than this, the cultivation of these activities is what is most needed in order to obtain the ends—moral, æsthetic, social, practical—of all secondary school instruction. They are needed in the work of the world if that work is to be well done. We easily translate these constituents of imagination into terms of art, morals, social efficiency, citizenship. “Clear seeing and truthful reporting” is the final word in all of the arts and sciences. Rightly understood, these two comprise all that can be done in either realm of achievement. Artist and scientist are credible only as they have insight or vision and report with truth. Moreover, the laws of construction which the reader discovers in a literary masterpiece, and which he attempts to observe in his own work as far as he may, are the laws of all of the arts and crafts. In leading readers and writers to detect and obey these laws, the teacher of English is developing the art instinct in the young. Further, these laws have also a direct application in the moral realm, a meaning so obvious that no youth can miss it. Selection is the principle of choice, abstraction is reflection and judgment, recombination in writing and speaking is the effort to make perceived truth or beauty intelligible, pleasurable, serviceable socially; unity is integrity, accuracy is truth-telling, method is law and order, due proportion is re-

¹ “Contributions to Rhetorical Theory,” No. III, *Bulletins of the University of Michigan*.

straint and temperance. Our terms are the terms of art, but they embody meanings that are highly significant for right living and good citizenship.

In Germany, where these, the ultimate ends of language and literature, have long been perceived by teachers of the mother-tongue, importance and dignity have been gained for even the minutest and most mechanical parts of language work. The small things get their true value and their due attention because of their known relation to the great ends which they are to subserve—right ideals, personal power, good habits—in a word, social efficiency. In America this clear perception of organic relationship between letters and living has been slower in coming. But each increase in the time-allotment for English in the secondary curriculum, each enrichment of the content of the course, has been due to some better conception of the ultimate value of English studies to society.¹

Various Ideals of English Study.—The first ideal was grammatical correctness, and so long as that ideal prevailed the single year of grammatical analysis, with occasional "rhetoricals" and essays, was sufficient. The next ideal was rhetorical correctness. It found expression in the Harvard requirement of 1874 that English composition and a few pieces of English literature should be studied, the end proposed being "accurate methods of thought and expression." Meanwhile, the growth of commercial courses, expressing the dissatisfaction of the business element with the traditional curriculum, kept alive the ideal of grammatical correctness. The ideal of immediate practical utility embodied in the commer-

¹ Herford, "The Bearing of English Studies upon the National Life," *The English Association*, June, 1910.

cial courses meant a rapid development in letter-writing, especially business correspondence, and greater attention than ever to the necessary details of grammar, spelling, punctuation, and form. The present ideal of social efficiency began to emerge after 1879, when the New England Association made an attempt to secure a uniform scheme of requirements for admission to colleges. This attempt was the beginning of a protracted consideration of educational values, including English, and the outcome was a permanent commission (1885), the English conferences soon after, and the "Committee of Ten" appointed by the National Education Association in 1892.

American educators were profoundly impressed and influenced by the declaration of the present Emperor of Germany, early in his reign, which began in 1888, in favor of a secondary curriculum for Germans that should give pre-eminence to the study of German language and literature, German mythology and history, German art and culture. This utterance emboldened those Americans who realized that a higher end than correctness must be proposed for English in the schools. In all of the investigations, discussions, conferences, and course-making that have since taken place, there has been accumulating evidence of the clearer perception of the social value of English.

Tests Applied.—This test has sometimes been narrowly applied, as in the exclusively utilitarian demand of the business man, in the fixed reading lists of the colleges (until recent years), in certain vocational demands upon English teachers in manual training and agricultural high schools, in the premium put upon American as distinguished from English literature. But these have

served to open discussions that have invariably led to a less partial view.

Results Attained by English Study.—The more important results for English ideals growing out of the discussions especially of the last twenty years may now be briefly stated:

1. Correctness, whether grammatical or rhetorical, is to be sought in all rational ways, but it is not the chief end of English instruction. It comes as fast as the social need for it is realized. The real effort for it begins when the youth conceives of himself as a member of a highly conventional society, and of good language as a requisite for winning favorable consideration for himself. Like bad manners, bad English is penalized by society, and nowhere so relentlessly as in business circles. The finest manners and language arise from an instinctive desire to please and not to offend. Correctness must come from the social motive. The teacher of correctness must supply the motive.¹

2. The end of English study being social efficiency, the form in which an idea is to be expressed is functional. The end to be achieved, the purpose in view, the person addressed, the social situation involved, combine to determine what, in a given case, the form shall be. Rhetoric is adaptation of means to end.²

3. English is almost the only opportunity available in the secondary school for acquainting pupils with the fundamental laws of art, which are also the laws of moral living. These laws are to be apprehended by analysis of the masterpieces of literature; they are to be applied by the individual in his composition-practice. They

¹ Thurber, C. H., "Five Axioms," *School Review*, 8:7.

² Genung, "Principles of Rhetoric"; Spencer, "Philosophy of Style."

are ineffective unless the attempt is made thus to apply them.

4. Most important of all is the perception of the social function of literature which is to be thought of by the secondary teacher mainly as a contact with ideas, rather than as a form study, mainly as a revelation in beautiful form of the aspirations and ideals of the race. A specific benefit for the individual is also to be sought from the study of literature, a benefit experienced, according to temperament, as consolation, inspiration, æsthetic pleasure, or sense of growth, but invariably thought of by the teacher in terms of character building. The idealism of literature also tends to prevent too narrow, too coarse, too "practical" a view of "social efficiency."

Improvement in Text-Books.—With the growth of social aims in English teaching, an improved text-book presentation of the subject appeared. Originally, rhetoric, as a topic in philosophy, was presented in the form of numerous definitions supported by reasoning and illustrated by examples. So many varieties of things, especially figures of speech, were catalogued that the term "botany rhetoric" was used to describe this class of books. When the ideal of "correctness" came in, these books gave way to a different kind of texts, which were repositories of all the sorts of errors in English that writers ever are guilty of. With the better understanding of the final ends to be achieved, a new crop of texts appeared. These emphasized constructive rather than critical power, and offered practice in writing a larger unit than the single sentence and a smaller unit than the formal essay. The single sentence does not long continue sufficient for expressing thought; the long essay is practically unmanageable in the class room. The para-

graph, then, became the object of study and effort, with the sentence of secondary interest. The social aspect of composition work is brought within the reach of the pupil's comprehension in the later texts by requiring him to write for a specified audience, in a specified character, and for a specified purpose. Thus, composition writing has become in the school the same thing as it is in the newspaper office or elsewhere in the world—the production of a body of intelligible discourse; to be corrected and revised in all of its details before being given any form of publication, but not to be written for the sole purpose of correction and revision; rather to be written for the purpose of communicating ideas.

The inference which these later texts have drawn from the doctrine of specific disciplines is that theme writing in schools should not be confined to one species—the book review—but should enter all of the fields of human interest within range of the secondary student's experience. Both in choice of topics and in kinds of writing attempted, great variety should appear. Hence the substitution of many short and varied themes for a few long ones. Recognizing composition as an art, these texts have not hesitated to utilize pictures, sculpture, architecture, and music, as well as literature, both as models for structural analysis and as affording subjects of interest in new fields. But they utilize, far more, subjects drawn from personal experience. These lie nearest at hand. These offer the opportunity of bringing the student in contact with many situations which he will have to deal with later in life. These help to make common life interesting.

Improvement in Methods of Teaching Composition.—Refinement of method in conducting composition work

has kept pace with improved text-books. As the real character of composition as an art is appreciated, writing (or oral composition) is the usual employment of the class hour, rather than reciting. In order that writing may be done within artistic limitations, it is preceded by prescribed observation or reading, note taking, arrangement of data, and tentative outlining. In the class there is, first, oral composition, each reporting his discoveries for the benefit of all; then a common outline is made, and, with this to guide, all write, or each speaks in his turn. The teacher who is overburdened with themes will utilize oral composition often, but no real teacher of composition will ever be without a set of themes. The mechanical features of writing are taught by an inductive study of models. Some of them are best taught in the individual correction of themes. Widely prevalent error is dealt with in the class hour, usually by work at the blackboard. Incentives to care in grammar and idiom, spelling, punctuation, and other details are (a) self-interest—the desire to be esteemed for social competency and to escape the social penalties of trivial blundering; (b) altruism—the desire to save the time of other people, to be a help rather than a hindrance; and (c) pride in the mother-tongue, which implies the desire to create better public standards of which a purer speech is indicative. The warfare upon errors of speech is waged in many ways and by the use of many devices. Whenever possible, the co-operation of all teachers in the school is enlisted in this warfare. The conviction grows stronger everywhere, however, that the true object of correction is to teach *self*-correction. Hence the private consultation hour, with its opportunity for individual instruction and for supplying right motives, has become a necessity, especially in large

schools. The class room is the chief place of publication. The teacher reads commendable parts of many themes, and sometimes gives A's theme to B merely because it is interesting. Publication in some sort is an absolute necessity; no one can write well unless he is sure of a reader or hearer. Communication, not mere expression, is the reason for writing. Publication in the class room offers also an opportunity for judicious criticism, the writer remaining unknown to his classmates, but this open criticism must never convey to the writer, though unnamed, the feeling of discouragement and defeat. Criticism should be sympathetic and constructive.

Improvement in Methods of Teaching English Classics.
—Refinement of method in the study of English classics has also been rapid and steady. Minute textual criticism no longer monopolizes the notes of school editions. In the later editions, a very great increase is noticeable in the queries, notes, and references that call attention to literary values, both the æsthetic and the ethical, and to the larger features of structure. As in the composition work, a new type of teacher has come; a teacher who tries to understand the specific needs of the adolescent pupil and tries to use literature advisedly in satisfying some of these needs; a teacher who is aware of the impulses to altruism, to religion, self-sacrifice, adventure, and hero-worship, that crowd in upon youth of high school age; the distracting tendencies to passive enjoyment of nature, solitude, and the inner life, on the one hand, and to ambition for active service and glorious achievement, or enthusiasm for "society," on the other. In prescribing reading, especially home reading, the teacher is spiritual physician. It is axiomatic in English teaching that a compelling motive for every new effort

should be supplied—one motive selected out of several that are always plausible. The kind of pleasure to be expected from contact with a new classic should accordingly be announced, whether it be pleasure in admirable characters, unexpected incident, mood, fresh ideas, nature description, imagery, music, or insight into the value and meaning of specific situations in real life. Purpose is a large word in the teaching of English.

In the class room itself conditions favorable to understanding and appreciation must be supplied. If the teacher is a good reader, or there are good readers in the class, oral interpretation is often helpful, as difficult passages are encountered. If there are good singers, some of the lyrics that have been set to music should be sung. As many of the themes of literature are also themes of painting and sculpture, worthy reproductions of the masterpieces in these arts should be sought. The portfolios of pictures gradually collected by the teacher to accompany the study of the English classics will be of constant aid in creating right conditions. Gayley's "Classic Myths in English Literature" should be known and read by every youth in the land.

The Class Hour.—The class hour presents the real test of teaching. Shall it be used for examination? or for stimulus? Few teachers attend to both with equal facility. Usually, if a teacher succeed in one, he is indifferent to the other. To offset personal bias, it is wise to leave a large place in the class hour for individual reports. The pupils have the floor, while the teacher is generous in his incidental outgivings. The work is social and co-operative, each pupil reporting for the benefit of all on a topic or a question previously assigned. The topics and questions deal with the principal thoughts and senti-

ments, with structural analysis, with conspicuous points of style and beauty. They should include (a) questions that will ensure intellectual understanding, (b) questions that will lead to appreciation, (c) questions that use the classics in order to help the pupil to a better understanding of life.¹ A few questions are better than many; no question should lack definite purpose, and each should be assigned with some reference to individual aptitude; this, because it is necessary that the pupil succeed, after reasonable effort, in doing commendable work. The feeling of growth in understanding, in appreciation, in competence, is better than all criticism and correction. The pupil's own crude inferences from the reading assigned are better than his reproductions of ready-made opinions from the critics. The teacher will prove his humanism by offering one question hour on each classic, when *he* does the reciting as his pupils present their difficulties. Confidence secured, all things are possible.

Miscellaneous Student Activities.—Recognizing the wider social relations of his work, the good teacher of English will not be indifferent to the student activities about him, in the literary and debating clubs, the reading clubs, the dramatic club, and the school publication. These require his active interest, his occasional presence, his constant advice, if they are to be of value. Walking clubs can be utilized as observation clubs in the English work. Visits to the library, with explanation of the use of catalogues and reference books, are useful. At least one large high school has a Round Table of teachers and older pupils for the discussion of the serious problems of life.

¹ Collections of these questions have been published. The most recent are: Thomas, "How to Teach English Classics"; Marsh and Royster, "Teachers' Manual for the Study of English Classics."

Meeting the Needs of the Individual.—The present problems of English teaching arising from the call for vocational education, from the demands of the commercial interests, from the college requirements, essentially repeat the old problem of the elective system. The teacher, who sees clearly the final purposes of English instruction, makes easy concessions to special demands merely by prescribing theme work and out-of-class reading that are deemed suitable for those concerned, without sacrificing in the least degree the discipline that is vital to all.

Preparation for Teaching.—Preparation for teaching English in the high school implies a broad college course rather than high specialization in English itself. The wider the teacher's acquaintance and sympathy with the different fields of scholarship and human endeavor, the better for him and for his pupils. In the field of English he must, of course, be widely read in the various periods and he should not neglect recent and current literature. He should know English and American history in their relation to literature. By mastering at least one language and literature besides English he has sure grounds of comparison. He perceives the permanence of literary themes and the contemporary nature of literary imagery. By adding to this some knowledge of Old and Middle English, he equips himself for a right understanding of modern English idiom. If he knows the history and principles of education, he may save himself from repeating some of the blunders of the past. Since success in his work depends upon establishing relations of confidence he needs more than other teachers to cultivate a liking for young people. Of prime importance to him are tolerance, patience, enthusiasm, a good voice, and a capacity for humor.

Need for More Teachers.—The chief obstacle to a fuller realization of the great purposes of English in the secondary school is the failure of school authorities to provide a sufficient number of English teachers. Allowance is not made, as it should be made, for the theme reading, the consultation hour, the personal attention which the English teacher feels it his duty to give to student activities.¹

Continuity Desirable.—The work of the high school in English should be continuous from the first year through the last. In any one semester each pupil should get all of his English instruction from one teacher and not from several. This permits correlations especially between composition, English classics, and literary history, that would otherwise be difficult. It permits, at times, when the need is seen, a concentration of attention upon a single element of English—grammar, for instance—and keeps all of the elements in right relation to reading and composition, the two main lines of effort.

General Scheme of Work.—Usually during the first two years the time is evenly divided between these two lines. In the last two years the proportion is one for composition to four for classics. In the earlier years the reading prescribed follows, in a general way, the scheme of the composition work, narration and description receiving the lion's share of attention; exposition, however, not being omitted. Later the study of Burke, Washington, Webster, and Lincoln eventuates in the writing of argumentative essays and the preparation of a debate.

¹ A special investigation of the physical problems of English composition teaching is now proceeding under the direction of a committee of the English Section of the Central Division of the Modern Language Association, Professor E. M. Hopkins, chairman. A preliminary report of this committee was issued in April, 1911, by the Graduate Magazine Press of the University of Kansas.

Selection of Reading.—In selecting reading for high school pupils, it is already well understood that the chief principle of choice should be the known needs of the adolescent. These are now pretty accurately determined and described. What is lacking in pedagogical practice at present, is an agreement on the one chief purpose for which each classic should be taught. Each classic will lend itself readily to several plausible purposes. The present need, from the view-point of the secondary teacher, is a programme of student readings arranged to cover the very numerous and widely diversified interests of the secondary pupil, in an orderly way; each piece of reading in its turn to subserve a single one of these numerous interests and all together to cover the field in at least a rudimentary way. To this end, two things are recognized as necessary: (1) Of the numerous benefits—ethical, æsthetic, or practical—to be derived from contact with each classic, the principal one must be agreed upon more or less arbitrarily in order that each teacher may know what to work for. (2) There must be a long period, say ten years, of experimentation in many schools operated under different conditions, as Professor Hanus has suggested for the arithmetic question of the elementary schools. Such a widespread experimentation will discover (1) whether a given classic is being taught with the best purpose in view, and (2) whether it has been properly placed in the course. Much of this experimenting has already been done. Many of the classics have now found their most advantageous place in the secondary curriculum. A study of numerous high school programmes of reading in the English classics reveals a surprising amount of agreement among programme makers who have been work-

ing independently. In the following programme only those classics are included concerning which a tacit agreement has evidently been reached by many schools. In view of the chief purpose, the need and the interest of the pupil, other considerations follow as corollaries. (a) Variety in reading-matter is provided for each year. (b) The idea of concentrating attention on a single literary type, form, or species, is frankly abandoned. (c) No thought of a historical or philosophical arrangement is entertained. (d) The English teacher is to sacrifice thoroughness to continuity of interest. (e) While obvious correlations with composition are not to be neglected, correlation is not to be considered as a leading aim. (f) Books offered for home reading are in general easier and lighter than those adopted for class study; they are drawn from various fields of interest and they include recent writers. It should be added that the number of books studied in class varies in different schools from four to twelve each year.

First Year.—In class: A Ballad Book; Scott's "Ivanhoe," "Lady of the Lake"; Irving's "Sketch Book"; Homer's "Odyssey" in translation; Shakespeare's "Julius Cæsar" or "Merchant of Venice." Outside reading with brief essays recorded in notebooks: Burroughs, Warner, Stevenson's "Treasure Island"; Macaulay's "Lays"; Hawthorne's Short Stories; Lincoln's Gettysburg Speech (memorized).

Second Year.—In class: George Eliot's "Silas Marner"; Goldsmith's "Vicar"; Lowell's "Sir Launfal"; Tennyson's "Idylls"; Irving's "Life of Goldsmith"; Burns's Poems; Carlyle on Burns; Gray's "Elegy"; Shakespeare's "Midsummer-Night's Dream." Outside reading: Bunyan's "Pilgrim's Progress"; Browning's

Narrative Poems; Holmes's "Last Leaf," "Chambered Nautilus" (memorized); Byron's "Prisoner of Chillon"; Stevenson's "Travels with a Donkey."

Third Year.—In class: Shakespeare's "As You Like It"; Palgrave's "Golden Treasury, 1, 2, 3, 4"; Coleridge's "Ancient Mariner"; Milton's "Minor Poems"; Macaulay on Milton and Addison; "The DeCoverley Papers"; Blackmore's "Lorna Doone"; Emerson's Essays; Bacon's Essays. Outside reading: Dryden's "Odes," "Palamon and Arcite"; Pope's "Rape of the Lock"; Stockton's "Rudder Grange"; London's "Call of the Wild."

Fourth Year.—In class: Shakespeare's "Macbeth"; Burke's Conciliation Speech; Washington, Webster, Lincoln; DeQuincey's "Joan" and "English Mail Coach"; Dickens's "Tale of Two Cities"; Thackeray's "Henry Esmond." Outside reading: Schurz on Lincoln; Churchill's "The Crisis"; Stevenson's "Virginibus Puerisque"; Howells's "A Doorstep Acquaintance," Farces; Poems of Poe, Whitman, and Kipling.

CHAPTER XII

PUBLIC SPEAKING AND VOICE TRAINING

DWIGHT E. WATKINS, A.M.

DEPARTMENT OF PUBLIC SPEAKING, KNOX COLLEGE

The claims of public speaking and voice training to a place in the high school programme of studies are quite generally recognized, but, strange to say, very rarely satisfied. This inconsistency is in large measure due to the tyranny of tradition and the crowded condition of our programmes of study, but its origin also lies in the inability of administrators to find satisfactory instructors. The shallow, volatile elocutionist, who betrays his calling by the way he says "Good morning," and whose mention always provokes an indulgent smile, has found little favor with those in charge of our public instruction. Fortunately this condition is being remedied by the more solid courses offered in public speaking by the special departments of our leading universities and a few of the small colleges; and the time is not far distant when almost any high school can find a special teacher, abundantly qualified for the task, at the stipend of the regular faculty member.

Value of Public Speaking and Voice Training as a High School Subject.—The value of the subject from a theoretical point of view is scarcely ever questioned. The arguments in its favor as a high school subject are:

(1) It is a very practical study. Almost every high school student will at some time find himself in a position where he will wish to address himself, in a more or less formal way, to his fellows. At such times a thorough training, even in the elements of public speech, will prove of inestimable value. He will at least be able to face his audience without distressing fear. He will be heard. He will not be so awkward as to jeopardize the success of his undertaking. His thoughts will progress in logical order and his emotions will neither be entirely suppressed nor yet allowed to run riot. To the boy or girl going directly into life, these accomplishments are almost a necessity; and to the one going on to a higher institution, they will be of all the more value because acquired while young, for he can use them directly in improving the quality of his work in the higher institution, or, having these attainments already out of his way, can devote himself to other pursuits or can carry his attainments to a higher degree of perfection.

(2) If excellence in the art is to be attained, it must be gained largely in the period of youth falling within the latter stages of adolescence, while the impulses to growth are strong and habits have not yet become set.

(3) The subject must be studied before the professional school is reached, for, with the increasing demands placed upon the curriculums of these institutions, it is evident that instruction in public speaking, like most of the instruction in English, must be relegated to the preparatory school; and this means that in many cases, where the student does not take the bachelor's degree before entering the professional school, the high school is the only possible place for acquiring his training. With the six-year course it is very evident that the high

school must provide some means for practice in the art. That the student in the professional school needs ability in speaking scarcely needs argument. Although oratory in the courts is said to be declining, it is nevertheless true that there is as great need for clear reasoning and vivid imagination to-day as ever, and, outside of his routine practice, the lawyer who has the accomplishment of pleasing public address certainly has the advantage. Among the clergy, the mere fact that the average holder of a pulpit must address his parishioners twice each Sunday makes it plain that oratory still holds a place. In journalism, always inseparably connected with politics, the public speaker has a wonderful prestige, while in medicine and dentistry the capable public speaker will always have the advantage accruing to a man who can appear to good advantage before gatherings of his fellows. In business the public speaker is becoming more and more of a necessity. In these days, when most of the larger business undertakings are in the hands of boards of directors, there must of compulsion be some one to present plans forcibly and clearly to these bodies of men.

Social Value of Public Speaking.—The social value of public speaking is, of course, its highest. It tends directly to make the student a more potent force in his environment. The subjects lending themselves most easily to treatment are naturally those dealing with national, State, or municipal welfare, and familiarity with these themes cannot but inspire a patriotic feeling. Moreover, the young men who have once tasted the joys of public address will never be quite willing to give them up, and in any crisis, by reason of their familiarity with public affairs and ready ability in speaking, they will stand forth as staunch defenders of the best policies. The

opportunity for teaching effective civics is nowhere better offered than in connection with the subject of public speaking. To teach that trickery and falsehood in a student's speech are most deplorable, and in the end unsuccessful, and to cultivate a keen appreciation of the opprobrium fitly heaped upon such practices in political fields is certainly a great part of the work of the teacher of public speaking, and this ethical value alone would be enough to warrant extensive space in the curriculum. Again, by the constant appearance of the student before his mates, there springs a desire for a strong, erect, powerful physical appearance. Strong lungs and an oratorical presence come to have an important place in the student's ideals. Moreover, he desires to possess power, he seeks to control, and thus becomes a more dominant personality.

Æsthetic Possibilities of Subject.—The æsthetic possibilities of the department are best developed in connection with the study of literature. It is needless to say that oral interpretation can do fully as much as philological research toward true taste in letters. It ought not to be possible for a class to spend half a semester upon "Macbeth" and *not read a single line aloud*, although this case, which came under the author's notice, only too clearly marks a tendency. The true test of a student's grasp of "Evangeline," as one writer has suggested, is "not whether he can give the exact date of the deportation of the Acadians, but whether his eyes grow moist at the death of Gabriel."

The external beauties of poetic construction, it goes without saying, must be given oral rendition in order to be appreciated. Rhyme, rhythm, and melody mean nothing to the ear that is not trained to their delights. Likewise the depth of tone and color that goes with

deep passion, the broken melody of ecstatic joy and triumph, the daintiness of manipulation that accompanies delicacy of conception—these evidences of true assimilation can only be secured through oral interpretation.

Training of the Voice.—The training of the speaking voice is certainly greatly neglected in our high schools to-day. The voices of our young people are strangely irresponsive to emotion. Our training is too intellectual. Centuries of repression in the class room have rendered it a place almost unfit for the best study of literature. We have sought too long to eliminate emotion from our mental activities. The naked bones of logic must be clothed with the flesh and blood of feeling. In listening to a class engaged in reading poetry, one is peculiarly struck by the atrophy of the finer vocal attributes. These should be restored. In their use the student will build up a more attractive personality. To express kindness, reverence, and gladness means building these emotions into the student's life, not only increasing his own enjoyment, but making him of more interest and service to his fellows. It is true that in securing this freedom of emotion the teacher must drive with a free rein, which does not lead to the perfect decorum of the purely intellectual class room, but in the hands of an able teacher this freedom will be infinitely more productive of telling results. We are beginning to understand also that the training of the emotions is important in determining conduct, and no better place can be found to do a large part of this work than in the interpretation of literary masterpieces.

Training of the Will.—The discipline of the will is no small attainment to be gained from the practice given in the study of public speaking. The student soon learns

that if he is to control his audience there must be an exhibition of his powers of determination. Earnestness must soon come to his rescue when he finds his school-mates getting the better of him as he stands on the platform. On no occasion must he discipline himself more rigidly. He must guard insistently against distracting circumstances in his audience; he must keep his mind strictly upon his theme; he must, at the start, at least, take care about his enunciation, his bearing, his general attitude; and all these things, and many more, must be attended to while his pulses are beating at an unusually high rate, while his cheeks are flushed, and while his voice, to say nothing of his knees, trembles violently by reason of his elevation upon the platform. He must not fail! He must go through or meet disgrace! Such opportunities for cultivating the will can scarcely be found elsewhere.

Improvement in Instruction.—In some form public speaking has always been recognized in the school curriculum. The great mistake has been made in supposing that almost anybody could teach it. Friday afternoon speaking, exercises on special days, commencement programmes, "rhetoricals," chapel services, and literary societies have always, in varying degrees of success, catered to the demand for skill in the art of speaking. These public occasions still offer probably the best field for actual practice, but they are now being supplemented by systematic instruction in the class room, and by special expert training before each public appearance. As yet there are few, if any, text-books suitable to put into the hands of high school students, but there are plenty of excellent manuals from which the teacher can glean valuable systems and helpful material.

Occasions for Public Speaking.—Devices for supplying occasions for the public use of speech have always played an important part in instruction in public speaking, this obviously for the reason that there are few *real* opportunities for the high school student to appear publicly. The debate, either between schools, or classes, or factions in the same school, probably ranks first. This is true, doubtless, because the debate, of all rhetorical forms, is the least removed from life conditions. "It seems the most *useful* because the most *used* form of speech." It cultivates, too, the ability to think and speak upon the spur of the moment, which makes for naturalness, in opposition to the fixed and careful artificiality too apt to creep into other forms. Debates were formerly carried on with one team from each school or faction. To-day, however, the tendency is to develop two teams, one upholding the affirmative side, and one the negative. These meet in simultaneous debates. This method avoids all unfairness in the balance of the question, for each school or faction has one team representing each side, and if victory is latent in the statement of the question each side will be accorded a victory. This method also obviates the rather undesirable transportation of large delegations of students from one school to another, for each school has enough to do in supporting its own team at home. It also doubles the effectiveness of the work, for there are in this case six debaters interested, whereas under the old system there were but three. It facilitates, too, work upon both sides of the question, which was always hard to obtain under the old system.

A modification of the dual debate is found in what is known as the triangular system, in which three schools

participate, one year all the affirmatives visiting, and the next year all the negatives. Thus each school debates two others, and may, as a result, win both debates, win one and lose one, or lose both. This triangular method has in one case, at least, been expanded to include nine schools, making a triple triangle and enabling the championship to be decided practically, although not absolutely, in two debates, the second debate involving no change of sides or further preparation, often a troublesome feature in the larger leagues under the old system. Pentangular leagues have also been organized.

Next to the debate, as a practical device, comes the oratorical contest, in which each contestant writes a speech, submitting it to judgment on thought and composition, and afterward delivers it, being judged with the others upon the effectiveness of delivery, the two sets of marks being collated in order to determine the winner. This has the advantage of the debate in that it tends to more care in the purely rhetorical characteristics of speech; grammar, punctuation, diction, rhetoric, are all rendered much better by this sort of a contest. There has been a feeling that under this system the most effective speaker often loses, and that it is impossible to accurately judge a speech in the manuscript without the personality behind it, but it is probable that whatever is lost in accuracy in this regard is gained in the work expended by the contestants upon the manuscripts, which would be of a much more careless nature were thought, composition, and delivery all judged at the time of delivery.

Another device, more closely connected with literature, but nearly always under the direction of the teacher of public speaking, is the dramatic club. The control of this organization requires a high degree of diplomacy

upon the part of the teacher, who must guide and inspire to the highest in dramatic literature in the face of much mediocre work upon the commercial stage. The power of the dramatic instinct, however, is one not to be despised, and when carefully supervised can be made subservient to great achievement. It is doubtful sometimes whether the strain of carrying a part in a three or four act play is a desirable thing. It is certain that there are numerous nervous breakdowns and failures in scholarship brought about by dramatic presentations. A remedy, perhaps, lies in taking only a scene or two from the plays studied by the club, or in presenting one-act plays not lasting over a half-hour. This plan by no means prevents the entertainment offered by the dramatic club from lasting a full evening; for two or three scenes, or short plays, may be presented the same evening by different groups of students.

In all the work there is a tendency to get away from exhibition merely to something more sane and of a higher order. Mere imitation, or the representative side of the art, is losing ground. The struggle now is for the manifestive. Delsartian curves, like Spencerian flourishes, have largely disappeared. To-day we tend toward the direct and business-like, eliminating anything which might attract attention to the medium of expression.

Status of Instruction in Public Speaking.—There are at present no statistics as to the exact status of instruction in public speaking in high schools. Not more than three years ago the author secured some data by rather wide correspondence, but no definite conclusions could be drawn except that there was a very chaotic condition of affairs throughout the country. The requirements differed from entirely compulsory to entirely elec-

tive regulations, and from one recitation a week for four years to a recitation every day for a semester. In reality there was probably no such discrepancy in the actual work done, as much of the instruction might be given outside of the regular curriculum through the devices mentioned above. The employment of a special teacher would prove no guide, for often some teacher of English would be doing the work although no mention were made of it. Developments will, no doubt, lead to the employing of a special teacher to look after the public-speaking activities of the students and to give systematic instruction in the subject. On the more æsthetic side the larger schools may supplement the work of the regular teacher of literature by the work of a teacher specially trained in oral interpretation. It is certain that more respect is being paid year by year both to forensics and interpretation.

At the 1910 meeting of the Illinois Association of Teachers of English, a committee,¹ appointed by the association, investigated the entire subject of oral English in the high schools of Illinois, and reported the following resolutions, which were taken up one by one and adopted:

I. Every Illinois high school should make some provision for training its pupils in the proper use of the English language.

II. It is highly desirable that all high school teachers, of whatsoever subjects, should lay especial emphasis upon clearness and correctness in reading and reciting.

¹This committee consisted of Professor Thomas H. Briggs, of the Eastern Illinois State Normal School; Professor John M. Clapp, of Lake Forest College; Principal W. F. Mozier, of the Ottawa High School; Principal F. D. Thompson, of the Springfield High School; Professor E. M. Halliday, of the University of Illinois.

III. At least one-fifth of the high school work in English should be devoted to oral composition and reading aloud, with particular reference to the correction of faults in articulation, pronunciation, and voice quality.

IV. It is desirable that teachers of English should themselves be fitted to give instruction in oral English, though there is no serious disadvantage in leaving such work to a special teacher, provided that it be closely correlated to the work in written composition and literature.

V. It is recommended that in all institutions fitting teachers to give instruction in high school English courses in reading and speaking be required as a prerequisite to endorsement for positions.

VI. This association is in hearty sympathy with other public-speaking activities within the school, such as debates, declamation and oratorical contests, dramatic performances, literary society work, etc., provided always that they be under the supervision of teachers and that they be conducted sanely and without artificiality or affectation.

VII. It is believed that inter-high school contests, including debates and oratorical and declamation contests, present grave dangers,¹ but that, if carefully superintended and strictly limited in number, they may be found to answer the double purpose of affording training in public

¹ As throwing special light upon this clause, the fact should be mentioned that the committee sent out to all the high school principals in the State the following question: "Has your experience with inter-high school debating been such as to lead you to favor it?" Ninety-four principals replied. Of these, forty-six answered "Yes"; twenty-seven reported no experience; five expressed themselves as in doubt; and nine answered "No." "It will thus be seen," says a member of the committee, "that high school principals, in so far as they have expressed any opinion, are decidedly in favor of debates between high schools."

speaking and lightening the over-emphasis likely to be placed upon athletic contests.

Preparation of the Teacher.—The preparation of the teacher is a very important factor in determining the value of work in public speaking. Nothing less than a college course should be demanded in the way of general education. In addition the teacher should have specialized in the work offered by the public-speaking department in his college or university. He might very well, although it is not necessary, have taken, in addition, some special training in one of the dozen special schools of oratory, so-called, located in various large cities. The pre-eminent requisites of personality for the teacher are, first, a vivid imagination, then a kind and helpful disposition; and to these must be added an unusual capacity for work. It is to be hoped that this last requirement will soon be unnecessary, but at present it is absolutely essential. The tendency of administrators is to demand class instruction during the regular hours of the session and then drill for public appearances after hours—drill on orations and discussions for chapel exercises immediately after school, and work with the contestants and with the dramatic club in the evening. It is either a wonderfully strong teacher of expression, or else a worthless one, who can close the year without severe nervous exhaustion. With the further development of the subject in the high school curriculum, doubtless these tendencies will disappear, but they are a serious fault in the present system.

The Future of Public Speaking.—Public speaking will always hold a prominent place in the work of the high school, and this in an increasing degree. Much of the work in the subject will be done through the activities

lying outside of the class room, but this does not mean that it will not be under careful system and supervision. Text-books for class instruction will undoubtedly appear, and with them will come more rigid and uniform requirements and a general improvement in the instruction.

CHAPTER XIII

LATIN

ARTHUR TAPPAN WALKER, PH.D.

HEAD OF LATIN DEPARTMENT, UNIVERSITY OF KANSAS

In the general questioning of the value of secondary subjects, Latin has perhaps received more than its fair share of criticism. If so, the too great vigor of attack has been chiefly a reaction against the too great claims that used to be made for the study—claims which were a natural heritage from the time when Latin was not merely the chief educational instrument, but a necessary means of communication between scholars. A more reasonable ground for a part of the criticism has been the failure of the friends of Latin to agree upon the purposes of the study. Nevertheless, in spite of criticism from without and disagreement within, the study of Latin has increased wonderfully in the last twenty years. The latest statistics of the United States Commissioner of Education are given in the report of 1910, p. 1141, and cover the years from 1890 to 1910, inclusive. Of the total number of pupils in both public and private high schools and academies, 33.62 per cent were studying Latin in 1889-90; the percentage of Latin students increased steadily till it reached 50.29 in 1898-9, a more rapid increase than was shown by any other subject during those years; since then the percentage has remained almost stationary, and was 49.59 in 1909-10. Only

English, mathematics, and history are being studied by a greater number of secondary pupils. The total number of secondary pupils studying Latin is now considerably more than half a million.

I

Aims of Latin Study.—The aims of Latin study need a careful consideration, not primarily for the purpose of justifying its pursuit by this vast number of pupils, but because the teacher's choice of methods and of text-books must be governed by his aims. Unfortunately Latin teachers do not always agree in the statement of their aims, perhaps do not always formulate them to themselves. But fortunately the disagreement is less serious than it sometimes seems, for all agree that Latin serves several valuable ends, and the disagreement is as to which is the most valuable and most to be emphasized in teaching. If agreement on this point is impossible, it is at any rate all-important that each teacher shall decide for himself what his own aims shall be, and that he shall adapt his methods to the furtherance of those aims.

The Ability to Read Latin not the Chief Aim.—The most obvious aim of Latin study is the ability to read Latin. While it would be absurd to deny that this is and must be a practical goal in all Latin teaching, it cannot be maintained that it is the chief goal, except perhaps for teachers in strictly preparatory schools, the majority of whose pupils are to take examinations for entrance to college. Comparatively few of the more than half million now studying Latin are intending to enter college, still fewer intend to elect Latin in college. For

the great majority the statement is grievously defective. On the theoretical side it merely removes the difficulty one step; for the value of the goal itself is not necessarily apparent. The ability to read Latin is worth something; but is one warranted in spending years in the endeavor to acquire it? And on the practical side there is the immense difficulty that the pupil does not and cannot learn to read Latin with any such measure of success as he can attain in the study of a modern language. This unmodified statement, that the aim of Latin teaching must be to teach the art of reading Latin, is the basis of much of the dissatisfaction with the results of classical study. For the natural inference is that, since Latin is studied for the purpose of reading it, and since the pupils do not learn to read it, either the study of Latin should be given up altogether, or its literature should be studied in translation, or some radical change in the method of teaching it should be adopted.

Disciplinary Value.—The chief purpose of the Latin teacher must be to inculcate habits of accurate thinking. This may not be the most important reason for including Latin in the curriculum, since other subjects, too, give discipline; but it is the first point to consider when one is deciding between rival methods or rival books. This statement assumes, of course, that no one longer holds to the too hasty generalization that the results of formal discipline cannot be transferred from one study to another or the affairs of every-day life; though it is admitted that to no one knows just the conditions for such transference. Assuming, then, the possibility of training the mental powers, the Latinist claims, not indeed that Latin affords the only means of mental training, nor that the study of Latin by itself gives a complete and well-rounded train-

ing, but that it does afford the most satisfactory training in a certain kind of reasoning for pupils of the secondary school age. Every sentence requires the exercise of keen observation, not only in the apparently simple matter of word forms and inflection endings, but in the more subtle and complicated indications of sentence meaning afforded by word order and by other means. Every sentence requires a series of correct inferences as to the relations indicated by the endings and the order. Every sentence requires, too, that the results of the pupil's reasoning shall be at once expressed in the best English at his command. These three processes—accurate observation, the drawing of correct inferences from the facts observed, the expression of the results, are essential processes in mental training. Both theoretical considerations and the experience of the past show that for these processes Latin furnishes material eminently suited to pupils of the secondary school age.

Value for the Pupil's English.—A second great aim of Latin teaching must be a better understanding of the English language and a training in its use. The great concern for the improvement of the pupil's English, manifested alike by school authorities and by the general public, has caused a very great expansion in the number of English teachers and in the time devoted to the study. Yet there seems to be no decrease in the dissatisfaction with the English used by graduates of our secondary schools. It seems not impossible that the great emphasis laid upon the work of the English department has worked harm, indirectly, by leading to a division of labor and to a shirking of responsibility by other departments. Perhaps the true solution of the difficulty will be found in some method of making all departments share the responsibility for

the English teaching. The department of Latin, more than any other, has the opportunity of co-operating with the English department. Latin, in fact, can perform a part of the task better than the English department itself. The study benefits the pupil's English both by enabling him to understand better its vocabulary and sentence structure and by requiring of him constant practice in English expression.

Probably no one can state with any accuracy the proportion of English words which are derived, directly or indirectly, from the Latin. It has been estimated at sixty per cent. Even this does not do full justice to the help given by Latin; for the words derived from Anglo-Saxon are the common words, those which are already familiar to the pupil, while those derived from the Latin are the longer, less familiar, more technical words. It is true that most of these words have undergone modifications of meaning in their passage from Latin to English; but the key to their history and meaning is found in the Latin. It is clear, then, that the Latin teacher should seek to clarify the pupil's ideas of word-meaning by emphasizing word-derivation.

Less obvious, but very real, is the effect of studying the grammar and the structure of the Latin sentence. It is true that English sentence structure is very slightly affected by that of Latin, so that the study of the one does not directly explain the other. But it may be doubted whether any pupil ever yet gained an understanding of the English grammatical system until the study of a foreign language forced him to think about grammar and to notice the differences between the foreign and the English systems. Modern languages are too similar to English in their grammatical systems to be of great

value in this respect. The Latin teacher has opportunities denied to the English teacher, and he fails in his duty if in teaching Latin grammar he does not teach English grammar also.

Still more important is the training in English expression which is afforded by the necessity of constant translation into English. Here is no mere opportunity of the Latin teacher, which he may embrace or not, as he likes; whether for good or for evil he does inevitably teach English of some sort. No school authority has the moral right to employ a Latin teacher who is either unable or unwilling to teach English well. The opportunity of the Latin teacher is even greater than that of the English teacher, in some respects: the amount of English composition which the pupil must prepare in translation is greater than the amount ordinarily required in the English class; the ideas which he has to express in English are more elevated than those which will come to his unaided mind, and are presented to him in wellnigh perfect form; he cannot shirk the expression of any idea which seems difficult to him, as he can in original composition; since there can be no question of what he is trying to say, the teacher can hold him more easily to a careful weighing of English synonyms and to a recasting of his sentences to bring out shades of meaning and of emphasis. Occasional exercises in written translation are most helpful in emphasizing the importance of care in translation. It should be possible to make an arrangement with the English department by which such exercises may be accepted and criticised by the English teachers, now and then, in place of the written work which they regularly require of their classes. Such an arrangement will obviate the objection of lack of time for written transla-

tions, and will ensure harmony and co-operation in the English teaching of the two departments.

Literary and Historical Values.—A third group of values has to do with the contents of the books read, chiefly on the historical and the literary sides. The student gains a detailed knowledge of certain historical events, both interesting in themselves and important because of the frequent references to them in English literature. And he inevitably becomes familiar with a small fraction of the world's great literature. The value of a first-hand knowledge of Latin literature is out of all proportion to the bulk of that literature; for English literature is permeated by Latin literature to a degree which none but a classical student can appreciate.

But if this knowledge of a few facts and this acquaintance with a few bits of literature comprised the whole historical and literary value of the study of Latin, it would have to be confessed that these ends could be attained better by the study of translations. In fact, just as in the case of the values already discussed, here too the process of learning is the important thing. The pupil does not merely learn some historical facts; he learns them by the best possible method, by original investigation from the sources. A wise teacher may lead him to see that he is getting beneath the surface of the ordinary text-book of history and may give him an impetus toward a juster conception of history than the conning of facts from a book. And for the genuine appreciation of literature in general, the habit of careful analysis and close study of the thought and form of expression is far more important than the amount of Latin literature which will be remembered. Such careful study is forced upon the Latin student by the difficulties of the

language, but it is hard to secure in the English class because the language seems to offer no difficulty to the English-speaking pupil.

The comparative importance of this literary and historical value needs the most careful consideration; for the teacher's whole choice of books and of methods will be influenced chiefly by his opinion on this point. If he underemphasizes it, he may be accused of teaching only the dry bones of his subject; if he overemphasizes it, he will defeat his own purpose by failing to give his pupils the firm grasp of the language itself which is essential for a real appreciation of the literature. There is little danger of giving this aspect of the work too much emphasis in college, or perhaps in the teaching of Vergil; but in much of the recent literature on the teaching of Latin there appears to be a tendency to carry this emphasis too far back in the course. For the first two or three years this value is much less important than those already discussed. During those years the amount of Latin which can be read is so small at the best that it would be idle to hope for much literary or historical value from it. At the same time the difficulties of the language are so great that it is unwise to devote any large proportion of the time to anything else. Every pupil can profit by the discipline and by the training in English which the study of Latin gives, but not every pupil can profit by its purely cultural value, nor ought every pupil to be expected to do so; a subject taught so generally ought to be taught with chief reference to its value to the many, not the few. Moreover, the historical and literary value requires maturity for any considerable realization by pupils.

But, though made subordinate, this purely cultural side of Latin study should not be neglected wholly. No one

can say in advance which pupils can and which cannot profit by it. Every pupil has the right to see that there is something higher in the study of Latin than mere language study. Those who are fitted to profit by it must be given an opportunity to find and to show their aptitude. The essential foundation for securing this higher value of Latin study is an intelligent comprehension of the contents of the books read. It is unjustifiable to allow pupils to feel that they are translating disconnected bits of Cæsar and Cicero. A few minutes of every recitation should be given to making sure that the pupils are following intelligently the narrative or the speech as a whole. How much more should be done depends partly on the class, partly on how well the teacher himself understands the campaigns of Cæsar, the rhetoric of Cicero, the motives and workmanship of Vergil. But the pleasure of seeing a bright class enjoy this aspect of the study should never beguile the teacher into forgetting that it must be subordinate to thorough linguistic work.

Ability to Read Latin Versus the Three Greater Values.—To return now, briefly, to the definition of the goal of Latin teaching as the ability to read Latin, it is clear, of course, that the practical aim must be to teach the pupil to read Latin, just as the practical aim of the foot-ball coach must be to teach his pupils to carry the ball over the goal line. But foot-ball is not retained as a college sport merely that a ball may be carried over a goal line; nor is Latin retained in the curriculum merely that pupils may learn to read Latin. If foot-ball is to remain a college sport, the coach must, it is true, teach his pupils to carry the ball; but all his tactics must be chosen with reference to the cultivation of courage, fair play, sports-

manship, whatever other good qualities are claimed for foot-ball. If Latin is to remain in the curriculum, the teacher must, it is true, teach the pupil to read Latin; but all his methods must be chosen with reference to the higher aims of inculcating right habits of thinking, of improving the pupil's English, and of cultivating his appreciation of literature.

II

The Course of Study.—In the great majority of schools the four year Latin course consists of: (1) A beginner's book; (2) books I to IV, inclusive, of Cæsar's Gallic War, with one exercise a week in composition; (3) six orations of Cicero, with one exercise a week in composition; (4) books I to VI, inclusive, of Vergil's *Æneid*, with or without composition. Until recently the very few universities which admit solely on examination have insisted upon slight individual variations from this traditional course. Now, however, the Commission on College Entrance Requirements, appointed by the American Philological Association in December, 1908, seems to have accomplished its chief purpose, of formulating a statement of entrance requirements which could be accepted by all institutions, whether they admit students on examination or by certificate. The report of that commission does not require specifically the course as outlined above; yet the general adoption of the report is making it possible to say for the first time that that course, properly taught, either does now or will soon prepare pupils to meet the Latin requirements of any college or university. Whether it is wise to choose just those authors, and always the same parts of them, and

especially whether this course best meets the needs of pupils who will never read Latin in college, are perhaps debatable questions.

Report of the Commission of Fifteen.—Though some provisions of the commission's report can be positive requirements only for those institutions which admit solely on examination, they can be adopted as recommendations by those which admit on certificate. That the report is acceptable to the latter is shown by its adoption, in 1911, by the North Central Association of Schools and Colleges. The essential part of the report is as follows:

"I. AMOUNT AND RANGE OF THE READING REQUIRED

"1. The Latin reading required of candidates for admission to college, without regard to the prescription of particular authors and works, shall be not less *in amount* than Cæsar, Gallic War, I-IV; Cicero, the orations against Catiline, for the Manilian Law, and for Archias; Vergil, *Æneid*, I-VI.

"2. The amount of reading specified above shall be selected by the schools from the following authors and works: Cæsar (Gallic War and Civil War) and Nepos (Lives); Cicero (orations, letters, and *De Senectute*) and Sallust (Catiline and Jugurthine War); Vergil (*Bucolics*, *Georgics*, and *Æneid*) and Ovid (*Metamorphoses*, *Fasti*, and *Tristia*).

"II. SUBJECTS AND SCOPE OF THE EXAMINATIONS

"1. *Translation at Sight.*—Candidates will be examined in translation at sight of both prose and verse. The vocabulary, constructions, and range of ideas of the

passages set will be suited to the preparation secured by the reading indicated above.

"2. *Prescribed Reading*.—Candidates will be examined also upon the following prescribed reading: Cicero, orations for the Manilian Law and for Archias, and Vergil, *Æneid*, I, II, and either IV or VI at the option of the candidate, with questions on subject-matter, literary and historical allusions, and prosody. Every paper in which passages from the prescribed reading are set for translation will contain also one or more passages for translation at sight; and candidates must deal satisfactorily with both these parts of the paper, or they will not be given credit for either part.

"3. *Grammar and Composition*.—The examinations in grammar and composition will demand thorough knowledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The words, constructions, and range of ideas called for in the examinations in composition will be such as are common in the reading of the year, or years, covered by the particular examination."

It will be seen that, in addition to its chief purpose of securing uniformity of requirements, the commission desired two things: (1) To emphasize the importance of sight tests; (2) to give the teacher a reasonable freedom of choice in selecting his reading material.

Translation at Sight.—There is, of course, no especial virtue in a sight test, regarded merely as a test. In emphasizing the importance of such tests the commission meant to urge that teachers should teach consciously for the power to read Latin. Yet it did not mean to recom-

mend any revolution in the methods of teaching. A pupil who has thoroughly mastered a limited but well-chosen vocabulary, the inflections, and the important principles of syntax, and who has learned how to attack a Latin sentence, will be able to pass such a sight test as is intended; and, conversely, sight translation is an excellent test of the pupil's command of these essentials. Moreover, if both teacher and pupil know that a part of the coming test will be the ability to translate, without help of any kind, a passage of Latin which the pupil has never before seen, their attitude toward vocabulary, inflections, and syntax will be very different from that which they will have if the decisive test is to be on the pupil's ability to remember the translation of passages previously read. Therefore, the teacher should let it be known that he will include such passages in every examination which he sets. But he should bear in mind three points: First, that the ability to read Latin is not in itself the real goal of secondary Latin study; second, that a certain natural facility will often enable a superficial pupil to surpass, in this test, one of more solid attainments; and third, that the test will not be fair unless the teacher makes sure that the words and constructions found in it are all among those which the pupil ought to know. The teacher's unaided memory cannot be trusted for this purpose. The words and constructions may be looked up for this purpose most easily in Lodge's "Vocabulary of High School Latin" and Byrne's "Syntax of High School Latin."

Choice of Reading Material.—As to the other subsidiary purpose of the commission, that of securing freedom in the choice of reading material, there is room for wide differences of opinion. Few would deny that well trained

and widely read teachers ought to be allowed to choose freely within reasonable limits. But the report will do actual harm if any teacher, understanding it as a recommendation, abandons the traditional course of reading without full consideration and adequate reason. Cæsar, Cicero, and Vergil were never imposed upon the schools by outside authority; they are the authors on whom the teaching profession, by long experience, has settled as being most suitable for the conditions of our American schools. The worst charge that can be made justly against them is that of monotony. We hear that it is monotonous both to read the same things over and over, year after year, and to continue reading one author throughout a year. But to the pupils of each succeeding class the books are new and fresh; the course is not arranged for the amusement or the instruction of the teacher; the supposed monotony of reading a single author throughout a year is at least partially balanced by the increasing ease of the Latin and the pupil's increasing sense of power as he becomes more and more familiar with the author's vocabulary, constructions, and style. Moreover, much of this supposed monotony will disappear if more attention is paid to the contents of the books. Those who find Cæsar, for example, least interesting are apt to be those who know least about him. An apparently weightier objection to Cæsar and to the orations of Cicero is that their subject-matter is not vitally significant for the pupil or for modern civilization. There is a modicum of truth in the statement; but to make it a serious objection to the use of Cæsar and Cicero in the second and third years involves two false assumptions: first, that the object of Latin study in those two years is to learn the contents of the authors read; second, that there are other more sig-

nificant authors whose works are equally suited in other respects to the reading of those years. The subject matter of both is important, serious, dignified, and clearly presented; the Latinity of each is wellnigh perfection; the style of each is perfectly adapted to his subject-matter.

But the foregoing is intended to advise conservatism, not inflexibility. Cæsar is probably better suited to the work of the second year than any other author or combination of authors; yet, if the work of the first year has not prepared the class to read Cæsar, it may be well to add to the preparation by having it read a little easy Latin such as *Fabulæ Faciles*. Parts of the last three books are more interesting than parts of the first four, and may well be substituted for them. The latter half of the first book, in particular, may well be replaced by either half of the fifth. The Civil War is less suitable, because it is more difficult in both language and story. It is a pity that a class should gain no more intimate insight into Cicero's own character and into the life of his times than it can get from his speeches; therefore, it may be well to substitute some of his letters for one or two of the speeches. Yet the letters are generally more difficult in both language and contents, and the amount that can be read is too small to make much impression. The third and fifth books of the *Æneid* can be omitted without very serious loss; but it may be questioned whether Ovid is worth substituting for them, though he is interesting and somewhat easier than Vergil. The misfortune of the Vergil year is not that too much Vergil is read, but that the whole cannot be read. Judicious selections from the last six books may serve to give a fair idea of Vergil's purpose as a whole, and seem superior

to Ovid as a substitute for the third and fifth books, if any change is desired.

Latin Composition.—The commission made no definite requirement as to the amount of composition; but it did recommend, in a part of the report not quoted above, that there be systematic and regular work in composition during the time in which poetry is read, as well as while prose is read. The equivalent of one period a week is usually allotted to this part of the work, and is little enough. As pupils commonly dislike composition, it sometimes appears to school authorities that both time and trouble could be saved by omitting composition altogether or by curtailing its amount. Possibly if one considered only the amount of Latin to be read, and cared nothing for the pupil's development or for his knowledge of Latin, some time might be saved. Probably, however, even on this basis of judgment it could be shown that the accuracy of knowledge attained through composition so facilitates the pupil's reading that time is saved rather than wasted. However that may be, no one who estimates the value of Latin study in accordance with the principles maintained earlier in this chapter will doubt that time is actually saved by composition. That is to say, if one could set up a certain definite attainable standard of the results to be expected from the study of Latin—so much discipline, so much improvement in English, so much literary appreciation, so much ability to read Latin—it is certain that that standard would be reached more quickly and more certainly by giving a part of the time to composition than by devoting it all to reading. For the aim of Latin composition is not something distinct and different from the aim of translation. No one wishes the secondary pupil to learn to write Latin as an end in itself. Composition

is to be taught as an indispensable supplement to translation in achieving the general purposes of Latin study. All of these purposes call for thorough study and accurate knowledge. Inaccurate knowledge, combined with notes and a sense of the general meaning, may enable a pupil to translate a good many Latin sentences; but it leaves him helpless in the face of any difficulty. Composition tests, as nothing else does, the accuracy of the pupil's knowledge of words, forms, and constructions; it gives him an incentive to learn these things accurately; it helps him to fix them in memory; it is the most potent influence in forcing him to notice and reflect upon the exact meaning of English words and idioms and sentences. If the pupil dislikes the work, it is chiefly because his knowledge is so inaccurate that he can be sure of nothing without looking it up; for pupils like what they can do well and accurately. The true remedy is more accurate teaching and more, rather than less, composition.

Formal Grammar Study.—Perhaps the most unfortunate tendency in the Latin teaching of the last twenty or thirty years has been the minimizing of formal grammar study. This has resulted in part from the mistaken belief that the literary and historical value is of chief importance in secondary Latin teaching, in part from a desire to render the subject easier. But a thorough and systematic knowledge of the grammar can be defended both for its own sake, as a mental discipline, and as a basis for the better understanding of the grammar of English and other modern languages, and as an indispensable tool for ascertaining with exactness the meaning of the Latin which is read.

The failure of pupils to grasp firmly the principles of Latin grammar is due in part to the general abandon-

ment of the former practice of studying the grammar straight through in daily assignments. It is due also, and perhaps still more, to the character of the beginner's books and the composition books which are in general use. For some years the majority of these books have presented the grammatical material in almost every possible order except the systematic arrangement of the grammar. Space will not permit a full discussion of the reasons alleged for this lack of systematic arrangement. It is admitted, of course, that some deviations from the system of the grammars are necessary. But the teacher is strongly advised to select both a beginner's book and a manual of composition that present the grammatical material systematically—that is, as far as possible, with all the declensions together, all the conjugations together, all the uses of each case together, all the uses of the tenses together, etc. Such a systematic arrangement makes the details easier to learn, to review, and to retain; it gives the pupil a chance to feel that he is definitely completing one subject after another and progressing toward the completion of a definite task, instead of learning a miscellany of disconnected facts from a seemingly endless confusion; it will in time let him feel that Latin grammar is a complete and well-organized whole.

III

The Training of the Teacher.—Both the many-sidedness of Latin study and the length of time during which the pupil comes under the influence of the Latin teacher make it fair to demand that the teacher shall have an especially wide and thorough training. Latin is one of the subjects which should never be taught by a teacher

who has had less than a full college course; for with less training than that the teacher must have either an insufficient knowledge of Latin or a narrowness of preparation which will not allow him to see the relations of Latin study to other subjects.

The Minimum Preparation.—The absolutely essential preparation of a Latin teacher consists of (1) an exact knowledge of the language itself—its forms, its vocabulary, its syntax, its sentence structure. Several college reading courses and one or two college composition courses are needed to give this knowledge. (2) A feeling for the best English usage, an ability to use good English, and an acquaintance with some of the best English literature. (3) Some acquaintance with the ancient world and with the conditions under which Cæsar, Cicero, and Vergil wrote. A good college course in ancient history, one in the history of Roman literature, and one in the private life of the Romans should be regarded as essential. If a course in Cicero's letters can be included among the reading courses, it will help materially in meeting this requirement.

The Adequate Preparation.—But the preparation just outlined represents only the barest equipment with which it is possible to do respectable work. No teacher with only that preparation can give his pupils all they ought to get from Latin. The fully equipped secondary teacher of Latin must have penetrated more deeply into the spirit of ancient civilization, by further study of ancient literature, history, and archæology. He must have pursued each of the branches of classical study at least so far that he can find and use all the evidence on any question that may arise in his teaching. That is, while he need not have added to the sum of hu-

man knowledge by original investigation in any branch of classical study, yet he must know how to find out what others have done, and must be capable of an independent judgment on it. This means, above all else, a knowledge of Greek, without which the teacher of Latin is even more helpless than the teacher of English is without Latin. It means a reading knowledge of French and German, in which much of the best classical work has been written. It does not necessarily mean the investigation work required for the degree of doctor of philosophy; but it does mean at least two years of graduate work in Latin and Greek with courses in the literatures, in comparative grammar, in political institutions, in ancient art and architecture, in the transmission of the classics to us through the manuscripts, and in other like subjects. It is more and more coming to mean an extended visit to Rome, preferably a year spent in the American School at Rome.

CHAPTER XIV

MODERN LANGUAGES

W. H. CARRUTH, PH.D.

HEAD OF DEPARTMENT OF GERMAN, UNIVERSITY OF KANSAS

Excepting a limited field of facial and sign expression, language is the primary means of communication for men and, hence, the primary means of acquiring all knowledge not arrived at by direct experimentation. From the moment of birth the infant is studying its mother tongue and devotes on an average one year to the acquisition of its first word, and five or six years to the mastery of a vocabulary of five hundred words and the management of the simple sentence. The average man never masters his language and even the so-called masters of the language are always at school, never complete their discipline.

Language Study Should Begin Early.—These simple observations furnish a foundation for the theory of language study when applied to a second language. It should begin as early as possible; it is preliminary, a means to other attainments; it cannot expect to proceed suddenly. It involves a training of the ear, of the memory, and of the analytical and comparative judgment. Inasmuch as the right relations of men depend upon correct understanding of terms, precision in language must accompany exact justice in conduct. Expression in language is a constant exercise in approximation to

reality, a constant appeal to the logical, the ethical or the æsthetic sense. A living language, when studied by a thinking being, is not only a science, but as its exercise develops in precision and variety and potency of expression, it becomes the highest of the arts. A common medium of communication is the primary essential to neighborly and national intercourse and good-will. The knowledge of a nation's language throws down the barriers of prejudice and opens the way to that nation's highest intellectual and spiritual treasures.

Early Methods of Instruction.—It was not until the eighteenth century that modern foreign languages received regular attention in the public schools, as French in the schools of Prussia. And not until the nineteenth century were they anywhere considered as possible equals of, or substitutes for, the ancient languages in the school curriculum. Until the second decade of the nineteenth century the method of instruction had been that of the instruction of monastic and parish schools in ancient languages, a foundation of grammar taught by memorizing of rules and forms and word-lists, followed by memorizing and translating and interpreting of texts. Everywhere, of course, individuals had learned living foreign languages by the simple old method of dwelling among and mixing with the people. Doubtless here and there some private instruction had followed this method. But regular school instruction had been deductive, or synthetic.

The Inductive or Reading Method.—In the first quarter of the nineteenth century James Hamilton in England and America, and Jacotot in France, introduced the analytic or inductive method, which has since been called the reading method: Beginning with a portion of text, memorized and explained, and deriving the principles of

grammar from this, to be in turn applied to further portions of text, the system of grammar approaching completeness as the amount of text became considerable. This method was applied to living as well as to ancient languages.

In schools for girls French and Italian had places in the curriculum long before modern languages were admitted to the secondary school for men. Special schools for commercial and diplomatic training also offered instruction in modern languages before they were accepted in the schools that prepared for college and university. The demand for the practical, "Realien," led in the second quarter of the nineteenth century to the establishment in Prussia of secondary schools in which modern languages displaced, or largely displaced, the ancient. In Germany these secondary schools, Realschulen and Realgymnasien, have many of the privileges of the Gymnasien, but their graduates are not yet received into all the schools ("Faculties") of the Prussian universities. In the United States modern languages were accepted as a portion of the requirement for college entrance as early as 1860, but as possible substitutes for Latin only since 1900 and only in a few of the Western universities.

The Natural Method.—In 1843, Gottlieb Heness, in his "*Leitfaden zum deutschen Unterricht*," announced a modified method of instruction which has since been widely developed and called the natural method; also, the genetic or the psychologic method. Its characteristic is the use in the class room of the language to be taught, both in the regular instruction and in conversation, which turns upon the "Realien" of the room; formal grammar is taught only as commentary on the lan-

guage used and translation into the native language is avoided. Nearly forty years after Heness, Sauveur applied the method to French in "Causeries avec mes élèves" and also to Latin. About the same time as Sauveur, Gouin in his "L'art d'enseigner et d'étudier les langues," developed a variety of this method, the chief differences of which are, the grouping of the exercises in logical series and the sentences of each exercise about a single theme or process, and the greater emphasis on memorizing. This method was later popularized by Bétis in England.

The Reform Method.—Only two years after Gouin, Viëtor, in Germany, gave the word for a reform of language methods in his "Der Sprachunterricht muss umkehren." It was several years before his suggestions developed into what is sometimes called the "phonetic" method, or, in Germany, the "reform" method. This again is largely a modification of the "natural" method, or, more closely, of the "psychological" method. It dwells strongly on conversation based on "Realien" and postpones formal grammar and literature beyond the first two years. Its marked characteristic is the insistence on physiological study of pronunciation and the use of phonetic alphabet and texts during the first two or more years of reading. The individual representatives of the reform have introduced various ingenious and sensible features into their instruction.

Development of Text-Books.—Live and wise teachers have taken note of the suggestions of all these methods, and the authors of text-books have adopted those that commend themselves as suitable to the conditions of American secondary schools and the preparation of our teachers. As a rule, what is put forward as a new method

is the method of an individual and can seldom be adopted bodily by other teachers. But the analytic, the genetic, the natural, and the phonetic methods have all made their impress on the text-books and apparatus of modern language teaching. In 1860 there were not over a dozen grammars and special school texts for teachers in modern languages in America. Within fifty years the number has grown to many hundreds, which are constantly being revised or displaced by better ones. Six or eight publishing houses devote a considerable part of their attention to preparing good texts for modern language work. While the teacher may well give heed to selecting the best of these, the poorest are much better than anything that was available sixty years ago.

Illustrative Material.—Similarly, the growing demand in all the newer methods for "Realien" has brought forth an increasing supply of illustrative material for the class room. Among these may be mentioned song books, for use in class and in the language club; stereopticons and reflectoscopes, with an enormous quantity of illustrations in the way of slides and postals; phonographs and speech records, though the supply in this direction is inadequate (however, with a little practice each teacher can make his own); maps of foreign countries and plans of cities; phonetic charts; wall pictures of foreign architecture, of scenery, of authors, and copies of works of art; illustrated books and illustrated journals. While it is not easy to obtain appropriations for these articles from school boards in smaller places, money may be obtained for such purposes by plays and entertainments given by the pupils in modern languages and sometimes by appeals to public-spirited citizens. Such gifts bless the givers and increase their interest in the schools.

The Preparation of the Teacher.—As in other fields, the teacher of a language should know his subject. He should also know the difficulties of acquiring it, that is, should understand the point of view of the learner. And he should know by theory and practice the devices, methods, and apparatus which best serve his end. "Knowing his subject" is, however, a relative expression. Opinion has been divided as to whether the teacher of a foreign language should, or need not, be a native to the language born. The native has a facility in the control of his language which others rarely acquire. But one may have this control and yet lack an essential element; the control of his subject by the teacher must be a *conscious* control. One who knows no language but his own rarely has this. Again, one who has himself had to learn a language understands its difficulties as a native rarely does. So that there are advantages on both sides. Certain it is, that the teacher of a modern foreign language should be able to express himself in it with reasonable ease. This power is rarely acquired in less than three or four years of consecutive study and then usually only by practice among natives. So that as a minimum preparation forty hours of high school or college study of the language, not less than twenty of this amount to be in college, and three months in the foreign country is a moderate requirement. It is assumed that the teacher has acquired during this course of study a knowledge of some of the masterpieces of literature, an outline of the history and the literature of the people, some acquaintance with their spirit, ideals, and customs. In addition to the knowledge of his subject on such a minimum basis, the teacher should have prepared for his work by special study of the methods of instruction, either by visiting and

observing the methods of successful teachers, or by the pursuit of special courses to this end, and if possible he should have had some opportunity to put these methods into practice under the guidance and criticism of experienced leaders.

In stating such a minimum of preparation, which in practice is much higher than that possessed by many who are compelled to undertake work for which they are not properly prepared, it is felt on the one hand that this minimum is pitifully scanty; and on the other hand the fact is not ignored that many a teacher of tact and gifts has succeeded with much less. Good-will and the desire to help, combined with good sense and a natural faculty of expression, are more essential for success in teaching than any prescribed attainments. Nevertheless, the good teacher should have all the attainment possible. Better if, in addition to the minimum here stated, he have a year or more in the country whose tongue he would teach, special study and training in speech physiology and phonetics, and knowledge of the historical development of the language. It is presumed, in what has been said, that the teacher has a thorough mastery of the grammar of his own tongue as well as a high school course, at least, in Latin. There is also gain in a knowledge of a second modern language.

The Time to Begin Foreign Language Study.—The average age of American pupils on entering the secondary school, fourteen, is too high for the best results in foreign language study. For the reasons suggested at the opening of this chapter the age of ten would be better. But it can scarcely be expected that a foreign language should find a place in the fifth grade, since the pupil's time is absorbed in acquiring the elements of his own

tongue and the rudiments of knowledge. In the seventh grade, however, time can be found, to be taken profitably from advanced reading and English grammar, for the beginning of at least one foreign language. There are good reasons to support the claim of either Latin or German for this place. If Latin is begun here, German has the advantage of the discipline thus obtained. On the other hand, the pupil of twelve is perhaps more easily interested in the living language. But if German is the language begun here, there are more chances that Latin will not be taken up at all. At any rate, the age of twelve, the beginning of the seventh grade, is, all things considered, the best place for taking up a foreign language, and it should be urged upon school boards as at least an elective, not waiting for the better day discussed in Chapter III, when this grade shall belong to the high school curriculum.

Under the four-year high school curriculum Latin is in a large majority of schools the primary foreign language, begun in the first year, while if a second foreign language is pursued it is usually German, to be begun in the second year. French may be taken instead of German, or it may be begun in the third year, although very few students pursue three foreign languages in the secondary school. Within the last ten years in many schools an option has been given between French and Spanish, or between German and Spanish, with many takers. In several States this option has been extended to the Latin, the only requirement being a certain minimum of foreign language. In all this variety one point is agreed upon: that two languages should not be begun in the same year.

It is not the purpose of this chapter to discuss in detail the relative advantages of the various languages. The

writer has some prejudice for the German. But, considering all the factors in the case—the established standards of Latin attainment, the value of the mental discipline to be derived from language study, together with the actual value of even a scanty acquaintance with Latin roots and forms and Roman traditions—the writer is inclined to counsel caution in substituting the as yet more yeasty ideals of modern language instruction for the sure benefits of the Latin, and to urge the speedy establishment of standards for the modern languages and thoroughness in the preparation of teachers of the same, against the day quite plainly coming when high school pupils will all have this option. When the teachers of German and French and Spanish shall have as definite aims, and be as thoroughly trained for their work, the writer believes that German at least will have nearly all the advantages of Latin, with certain others that more than counterbalance those the German has not. Certain geographical locations will turn the scale slightly in favor of Spanish or French as the first language to be taken up.

Courses in Modern Languages.—The Committee of Twelve of the American Modern Language Association (see Report in Bibliography), has carefully outlined the work of two-year, three-year, and four-year courses in German and French, recommending that these be called elementary, intermediate, and advanced courses. The suggestions of the committee have been widely followed and have been subject to slight revision by various State and district conferences. The high school teacher is advised to procure and study the report. The list of texts recommended by the Committee of Twelve to be read in the various grades may wisely be extended. If the high school course in German or French is limited

to two years, as in so many cases, it seems highly desirable that the pupils should not lose this, perhaps their only, opportunity to become acquainted with a standard classic of the language studied. In this case "Wilhelm Tell" for German and "Colomba" or "Le Cid" for French may well be read in the second half of the second year. In German, at least, no one-year course should be encouraged.

The following may indicate a fair division of the work by years, or units, meaning five periods a day for the school year.

1. The work of the first year should comprise:

(1) Careful and persistent drill upon connected pronunciation;

(2) Drill upon the rudiments of grammar; viz., upon inflections, including the more usual strong or irregular verbs; also upon the use of the more common prepositions, the simpler uses of the modal auxiliaries, and the elementary rules of syntax and word-order; accompanied by

(3) The memorizing and frequent repetition of easy colloquial sentences;

(4) Abundant easy exercises, designed not only to fix in mind the forms and principles of grammar, but also to cultivate readiness in the reproduction of natural forms of expression;

(5) The reading of from 50 to 100 pages of graduated texts from a reader or other text, with constant practice in translating into German easy variations upon sentences selected from the reading lesson (the teacher giving the English).

2. The work of the second year should comprise:

(1) The reading of from 150 to 200 pages of suitable texts in the form of easy stories and plays;

(2) Accompanying practice, as before, in the translation into German and easy variations upon the matter read;

(3) Continued drill upon the essentials of the grammar, including the difficulties of the infinitive and the subjunctive, the separable verbs and word-order.

The net results of the first two years of a high school German course should be:

(a) A correct and ready pronunciation.

(b) A ready, *exact*, and fairly complete working knowledge of grammar, especially on the formal (inflectional) side.

(c) At least some ability to speak and understand the foreign spoken language.

(d) A better understanding of the grammatical structure of the English language.

The work of the third year should comprise (1) a thorough and systematic review of the grammar in connection with suitable systematic practice in composition; (2) the reading of some three hundred to four hundred pages of moderately difficult prose and poetry with an effort to secure its appreciation as literature.

The work of the fourth year should comprise the reading of about five hundred pages of good modern literature, with reference readings on the lives and works of the authors, the writing of short themes upon the work done, and perhaps a brief outline of the history of German literature.

In the case of French this programme may serve with an increase of fifty per cent in the amount to be read.

CHAPTER XV

HISTORY, CIVIL GOVERNMENT, AND POLITICAL ECONOMY

WAYLAND J. CHASE, A.M.

ASSOCIATE PROFESSOR OF HISTORY, UNIVERSITY OF WISCONSIN

Importance of the Study of History.—Modern educational theory in interpreting education as adjustment, necessarily gives an important place in the school curriculum to history and its cognate subjects, civics and political economy. The high school pupil is a member of society and a citizen of a commonwealth, with social and political obligations that grow with his growth, and it inevitably results that social and political institutions constitute increasingly important elements in his surroundings. These he must understand if he is to be a good citizen, and he can really understand them only in the light of their origins and through acquaintance with their growth and development. What geology does for the student in revealing the changes through which the earth's surface has come to be what it is, history with civics and economics does for him in the realm of human activities, explaining how and why men have come to possess their present ideals and beliefs, to have the forms of industry, government, law, and religion that they now have, and to live according to present modes and customs. These subjects, interpreted to boys and girls by wisely directed study, revolutionize their conceptions of their relations to mankind and to society, and their ideas of

their country's relation to the world; thus human sympathy is developed and strengthened, and provincialism broken down.

The ability to take large views of life's concerns and interests, freed from narrow ideals and restricted outlook, is reckoned an element of strength in an individual. So travel, giving the sense of space and of largeness of the world, and acquaintance with new conditions of life, is felt to be a great advantage. After the manner of the favored traveller, the student of history traverses distances, especially in the realm of time, and not least important among the results of this journeying is a real conception of the meaning of time, such as can be obtained only from the study of man's slow progress upward. In learning to reckon progress from the stone age rather than from the immediate past, the pupil takes a long step away from narrowness and provincialism, and comes into contact with peoples previously undreamed of, working under strange and novel conditions at tasks unheard of by him before. His horizon is extended, the mansion of his mind is refurnished. He is enabled to view and estimate life's affairs apart from their immediate relation to himself.

In all this there is much more than the pageant element, the moving picture show, for, besides the broadening and liberalizing effects which enlarge the spiritual nature of the pupil, these studies also afford intellectual training of very definite sort.

Memory is the most wonderful and important of our intellectual faculties, and all that tends to strengthen and develop it is of the highest importance. History is foremost among the studies that do this, for in its very nature it is a memory study, and memory gains facility by practice. It has been too common to decry the practical value of

the imagination. Attention needs often to be called to the fact that all exploits begin with a vision of the possible and are products of constructive imagination. To be able to dream great things must be wedded to the capacity to accomplish them in order to have efficiency, but imagination is an essential element of this partnership. The study which compels the pupil to hear the shock and clash of the Persian and Greek ships at Salamis and to feel the suffering of our forefathers at Valley Forge is continually an exercise in constructive imagination. That mathematics and natural science train the logical powers and develop the judgment all concede, but these studies deal with problems the conditions of which in their comparative simplicity are unlike every-day human conditions, and they teach conclusions whose certainty is rarely to be found in practical life. How delightful it would be if every life problem could be solved like an equation by substitution, and how grateful would be that assurance of the correctness of the answer which we feel when the problem in mathematics has been solved! That very certainty of conditions and conclusions which characterizes these properly named exact sciences is wanting in the problems of life. Life is not an exact science and its problems are complex and intricate and require for their solution the careful balancing of considerations, and examination from several sides. The problems presented by the study of history are just the problems of every-day life with all their complications, intricacy, and human quality, and therefore afford excellent material for the practice of judgment and training of the reasoning powers. History deals with men and women, with motives of human action, and with agencies that have influenced human life and still continue to do so. No

other study offers such opportunity for training in estimating men, their characters, their powers, and their probable courses of action. There is brought to the student a growing realization of the complexity of civilization and society and of the multitude of causes and agencies at work, and he becomes habituated to seeking and weighing evidence and to suspending judgment till all has been heard.

These intellectual values constitute the choicest products of this study, but it must be recognized that they are yielded up to the student rather than to the mere reader: that the study of history involves and demands the application of aims and methods as earnest and thorough-going as those by which enduring success is obtained in other fields of knowledge. From such study there may also be expected training in oral and written expression and ability to use and enjoy good books.

Undoubtedly ethical training is also afforded, especially in the form of ideals. It is proverbial that truth embodied in a tale has great power of penetration, and doubtless most of these ethical lessons can be left for history unaided to teach.

History as a High School Study of Recent Adoption.—The recognition of the value of history for high school pupils has come practically within the last quarter of a century. Before 1892 history had not been generally adopted as a high school study, though general history, American history, ancient history, and occasionally English history were all variously included in some high school courses of study and in many college entrance requirements. At the Saratoga meeting of the National Education Association, July, 1892, a committee of ten was appointed to select members of conferences which

should consider, for each subject of the programme of secondary schools and of college admission requirements, "the proper limits, the best methods of instruction, the most desirable allotment of time for the subject, and the best methods of testing the pupils' attainments therein." For the subjects of history, civil government, and political economy, a sub-committee of ten was appointed which met in Madison, Wisconsin, December, 1892. In their report this sub-committee recommended that in school programmes there be given to history not less than three periods a week for eight years, of which four should be in the high school and four in the grammar grades. Definite and detailed recommendations were made as to methods of teaching, qualifications of teachers, school apparatus, and fields and topics for study. By the finding of this conference and the discussions it aroused, a definite impetus was given to the study of history in American secondary schools, and by 1896 there were more than two hundred thousand high school pupils studying this subject.

Nevertheless, though other national and State educational organizations had given consideration to these matters, no general agreement had yet been reached as to relative values, proper order and place in the school curriculum of the different subjects of history, and uniformity as to aim and method of teaching. In view of this situation the American Historical Association, in the winter of 1896, appointed a committee of seven members to consider history in the secondary schools in its various aspects, and report to the association. This committee gave prolonged and detailed consideration to the subject referred to it and made and published recommendations which have been especially influential.

This Report of the Committee of Seven recommended that where possible there should be in the high school curriculum four blocks or periods covering four years. (1) Ancient history, with special reference to Greek and Roman, but with a brief introductory study of the more ancient nations, and extending to about 800 A. D. (2) Mediæval and modern European history from the close of the first period to the present. (3) English history. (4) American history and civil government. For those schools where four years for history appeared impracticable, it was suggested that either English and American history be combined and the main facts of English history taught through American colonial and later political history, or that English history be treated "in such a way as to include the most important elements of mediæval and modern English history." The committee urged strongly the value of historical study, denied, however, value to general history, discussed at length methods of teaching and qualifications for teachers of history, compared American with foreign teaching of this subject, treated briefly of history below the high school, and in various other ways presented much helpful material for teachers. The teaching of history in the secondary school has been largely shaped by this report.

A Committee of Five was appointed by the American Historical Association in 1907 to determine what modifications, if any, were needed in the recommendations of the Committee of Seven. The report of this later committee appeared in 1911 and in very large degree supported the recommendations of its predecessor. Recognizing the growing interest in the study of modern European history, it suggests a new schedule of history courses. Of this the first year is to be ancient history

as in the recommendation of the Committee of Seven; the second year English history to about 1760, including the chief facts of general European history and of American colonial history; the third year modern European history "including such introductory matter concerning later mediæval institutions and the beginnings of the modern age as seems wise or desirable, and giving a suitable treatment of English history from 1760"; the fourth year American history and government, so apportioned that two-fifths of the year shall be given to the separate study of government. The report presented, also, fresh and pertinent suggestions as to method of treatment of these periods, and urged that the time had arrived when in many high schools three years of history should be required of all pupils.

Besides the National Education Association and the American Historical Association, both of which continue to work for the advancement of history teaching, other teachers' organizations have rendered great help. Especially important of these are the New England History Teachers' Association, the Association of History Teachers of the Middle States and Maryland, and the North Central History Teachers' Association.¹

The Place of History in the Curriculum.—While there is still no uniformity of practice, the majority of high schools that offer four years of history follow the plan of the Committee of Seven, and those that offer three years commonly place ancient history in the second year of the high school, either mediæval and modern history or English history in the third year, and American history and civics in the fourth year. In a very large number of ele-

¹ This is now the Teachers' Section of the Mississippi Valley Historical Association.

mentary schools United States history is taught in the eighth grade, and thus quite generally the beginnings of history study have been made before the pupil enters high school. With greatly varying content and emphasis, other history subjects are taught in lower grades of the public schools of some of the States, but there is no uniformity of practice in this particular.

Methods of Teaching.—In this subject, as in all others, methods of teaching are individual, varying with the teacher and with the conditions under which the work is done. Yet there are three recognized methods which may be considered separately, though their difference is practically one of emphasis. To some teachers the attainment of the values of history seems possible only through a study of source material. They would have their pupils get information and draw conclusions not from secondary narratives but direct from the raw material of history, and they claim for this method greater vividness, vitality, and interest, more real training of the judgment, and generally more substantial results than from any other method of study of the subject. Opponents of this method contend that it requires more source material and more time than can be put at the disposal of high school pupils, and that it demands more maturity of judgment and trained powers of investigation than boys and girls from fourteen to eighteen years of age ordinarily possess.

To some the topical or library method commends itself. This is based on the assignment of topics and references to many books and does not rely on a narrative text-book, though it may be directed by a printed syllabus. For this there are claimed the advantages of independence of a single author's interpretation of history, the acquisition of facility in the use of books, and in collecting, com-

paring, and estimating data, training in "the art of balancing probabilities and forming defensible opinions," and greater interest, since a wider reading is insured and the relations of history are more appreciated. The disadvantages urged against it are that it is a difficult method for all but experienced teachers, that a larger reference library is required than is ordinarily provided by school authorities, that pupils often obtain unconnected information, and that the expectation that pupils will profit from the reports of other pupils is not generally realized because of the inability of pupils to hold the attention and interest of their fellows.

The third method rests upon the use of a narrative text-book in which regular assignments are made, and which is supplemented by assigned readings in both source and secondary materials. This obviously contains elements of both the other methods, but it claims the special advantages of being more serviceable for the inexperienced teacher, of giving greater promise of the mastery of essential fact material, of insuring organization and order for the knowledge acquired, and of affording at the same time opportunity for securing for the pupil interest in the subject and all the values that the study possesses. Absolutely essential, however, to this method are painstaking care and judgment in the use of the text-book, and skill and persistence in the preparing and directing of the pupils' supplementary reading.

The successful use of the text-book imperatively demands of the teacher not merely adequacy of knowledge of the general subject of history, but precise knowledge of the content of each lesson in the text-book, for it must be recognized that text-book material has varying values: some of it is of prime importance and must be accurately learned; some, having a subordinate or illustrative value,

needs to be understood but not to be learned, and some may even be disregarded. Moreover, it is the pupil's right to know in advance of study what these values are and it is the teacher's duty to make these known. Therefore, the assignment of the lesson to the pupils should be so specific as to indicate exactly what of the text they must learn and what may be slighted. Furthermore, the assignment should be interpretative to the extent of insuring that the pupils when they begin the study of the lesson shall not be confronted with problems of language or idea too difficult for their unaided comprehension; also, it should contain the problem element so that other mental processes besides memory shall be brought into the study of the lesson, and it should be given in such form that the pupils may make a careful written record of it. The best method of keeping this record is in a loose-leaf notebook which may well be made the repository of all the rest of the pupil's written work, such as notes on outside reading, topic or chapter outlines, brief written tests, and outline maps.

Success in directing the supplementary reading of pupils is made difficult in very many schools by a lack of library facilities, and especially by a failure to provide enough copies of the same books. The problem contains these elements: The selection from the available books of material really supplementary to the essential facts of the text-book; such a method of assigning this reading as shall make clear to the pupil both precisely where and precisely what the facts are that he is to search for; the making the available books as accessible as possible for all, and the adjustment of the time demands of this outside reading to the other school demands upon the pupil; and the devising of adequate means for securing

the faithful performance of the tasks set. The amount of this supplementary reading must vary with the experience and skill of the teacher, the maturity and proficiency of the pupils, and the library facilities of the school. The recommendation of the Committee of the North Central History Teachers' Association in 1908 set the minimum achievement "in carefully selected supplementary reading" thus: "In ancient history, 200 pages; mediæval and modern history, each, 150 pages; English history, 300 pages, and American history, 350 pages; of all of which one-fourth should be source material."

Aids to Teaching.—Most facts of history have vital relations of time and place, so that, involved with the questions of what and why, are also the questions of when and where. The element of chronology it is desirable to reduce to its lowest terms, but certain pivotal dates are absolutely necessary, and should be fastened by drill, time charts, frequent questioning as to contemporary happenings, and all other suitable devices. The relation of geography to history involves more elements than space and distance, and the student must be taught very early to interpret a map in terms of the physiographic features it presents and to respect the significance of these. Wall maps, charts of historical geography, the maps and plans of the text-book, and atlas and outline maps are all valuable aids. In the first two marked improvement has been made in recent years, so that clearness and simplicity, due emphasis on physiographical features, and accuracy are now characteristic of them. The history text-book is not now considered adequate unless it contains many maps to illustrate and re-enforce the narrative. Outline maps lend themselves admirably

to the developing and testing of the geographical knowledge of pupils, but should be used with a clear recognition of two dangers—one, that too great a dependence on them keeps the pupil from acquiring, through practice in making his own outline maps, a real knowledge of continent coast-line or territorial shape; and the other, that the picture-drawing feature, especially where coloring of political areas is resorted to, becomes an end in itself.

There are other aids which every well-equipped class room should have, especially illustrative material in the form of pictures, busts, and models. The first named, for the wall and for individual use, are now provided at small cost by many dealers, and in great variety. The stereopticon and reflectoscope are of the highest value as agencies of illustration. Under the stimulus of the example of foreign manufacturers, especially of Germany, the sources of illustrative material of all these sorts are multiplying in our country.

Civil Government.—Civil government is taught through and with history, and, in addition, is commonly allotted its special portion of time. This allotment is usually in the senior year, where it sometimes precedes the course in United States history, but commonly follows it. To make it the effective training for citizenship that it is designed to be, every effort must be employed to give it concreteness and to implant in the pupils high ideals of citizenship as well as information. These ideals are best inculcated when the pupils are made to realize fully that they are already citizens and possess present duties and responsibilities in connection with both the school and the community life, and are kindled to a real zeal for the discharge of these obligations. Concreteness can be given to the subject by identifying it as fully as possible with

those aspects of government most near to the pupils and most easily observed and studied in their every-day workings. Visits to the various departments of local government, talks to the class by local government officials, the possession for purposes of examination and study of as many legal and political documents as possible that are part of the machinery of government—all assist in giving reality and vitality to this subject instead of permitting it to seem merely a school study.

Political Economy.—The last two decades have seen greater emphasis laid on the economic aspects of history, and in consequence the high school student has received more training in the principles of political economy through his history study than was once the case. The Committee of Ten of the National Education Association, because of the lack of adequately prepared teachers and proper text-books, recommended that this subject be not taught as a separate study in the high schools. But the increase in the number of commercial high schools and the growing demand for commercial subjects have operated to improve the text-books and the qualifications of teachers, and the study has now an independent status in many school programmes. The methods of teaching demanded by it are essentially those of history and civics; success, however, requires an even larger use of illustrative material and of the facts of the pupil's environment, to the end that the subject of economics shall be made real and closely related to his every-day life. Purely text-book work in this subject is peculiarly ineffective, and consequently it makes all the greater demand upon the knowledge, the enthusiasm, the skill, and the resourcefulness of the teacher. Reports on outside reading, debates, study of current topics, close scrutiny of local

economic problems and conditions, all must be brought into service.

Unusual Demand on Teacher of History.—History, civics, and economics poorly taught have even less value as instruments of education than the older subjects of the high school curriculum when inadequately handled. For the former do not of themselves furnish a strong stimulus to intellectual energy. Whatever liberalizing influence the reading of history may have for the thoughtful adult, it is for the average boy and girl but a superficial process, not possessed of great value. History must be interpreted for the high school pupil; the skilful teacher must take him back of words and phrases into the meaning, and must put the problem element into the subject so that the pupil may be made to think while he reads. In many other subjects the teacher has the aid of recitation features that serve to fix the attention, as the text does for the student of language, or the blackboard figure and the algebra problem in black and white do for the student of mathematics, or the tangible material of the laboratory does for the student of science. The teacher of history, and of its allied subjects lacks these auxiliaries, and must supply from his own personality or resources as a teacher a correspondingly larger power to interest and to hold the attention of pupils. It is still sometimes the case that any teacher of the high school force who seems to be not fully occupied is judged competent to take the courses in history, but it is more and more recognized that the subject really calls for special qualifications and preparedness.

Preparation of Teacher of History.—This preparation should consist first of all in adequate knowledge of the subject. This operates for the teacher's success in a

variety of ways. It insures that truth, not misinformation, will be the portion of the pupil; it enables the teacher to enrich the recitation by positive contribution of worthful fact, by clear interpretation of difficult material, and by illuminating illustration; it inspires the respect of the pupil which in turn begets that docility which is truly the beginning of wisdom, and it affords to the teacher in the class room independence of the text-book, and gives him better mastery of discipline; it places time at his disposal for the deliberate consideration of questions of method and for devising ways and means of giving superlative effectiveness to the recitation.

The prospective teacher in his own study of history should have two aims: first, to gain a general knowledge of each of the four fields taught in the high school, such as would be secured from a year's college course in each; second, such intensive study of selected periods as will suffice to secure appreciation of the task and the methods of the historian and to become acquainted with the principles of historical criticism.

But it is not enough that he should have some degree of scholarly grasp of his subject. He should also understand the times in which he lives, he should understand boys and girls, and should have an intelligent appreciation of the services which the high school is expected to render to society. To know his own times he needs to be as broadly trained as possible, through a range of subjects that interpret life, society, and government. The demand for broad outlook on life and for broad human sympathies is made with special force of teachers of history because in the complex of forces and agencies that have made history, the same influences have been active that make up the life of to-day. So that it is as true that

one must know his own times in order to understand the past as it is that one must know the past in order to comprehend the present.

The innate and often unrealized understanding of boy and girl nature is doubtless that quality which "born teachers" have in an unusual degree, enabling them skilfully to adapt methods of teaching and subject-matter to their pupils' needs. Some of this sort of grasp the prospective teacher must seek from courses of study on psychology and educational theory, especially related to the period of adolescence. His knowledge of history must be reshaped and worked over with a view to meeting the needs of immature minds; he must endeavor to gain through courses on methods an acquaintance with some of the special problems that history teaching presents; and through observation of the work of skilled teachers and through practice work under expert guidance he should seek skill in presenting the subject to the immature.

CHAPTER XVI

DRAWING, FREE-HAND AND MECHANICAL

WALTER SARGENT

PROFESSOR OF FINE AND INDUSTRIAL ART IN RELATION TO
EDUCATION, CHICAGO UNIVERSITY

Importance of Art Study.—The fine arts of all centuries present concrete embodiments of certain phases of human experience which have no other adequate language, and which are comparable in importance and influence to the experiences expressed through literature and music. Where acquaintance with art is lacking, the individual is largely shut out from these significant fields of human expression and interpretation.

Appreciation of art means ability to avail oneself of the interpretations of these phases of human experience. This results not only in the enjoyment of the particular objects of art studied, but also in appreciation of the type of beauty which these works of art embody when it occurs in nature; because it is generally true that the finer effects of natural beauty are evident to the majority only after they have been interpreted into some form of artistic expression. In other words, things become picturesque after they have been pictured. Thus, one who has come to enjoy a great landscape, perhaps by Corot or Turner, or an unusually subtle type of human beauty, as the "Unknown Lady of the Louvre," finds that he

recognizes in familiar landscapes or in actual faces effects of beauty which the artist has interpreted for him and which he would not have noticed but for his acquaintance with that interpretation.

Function of Art in Public Education.—One's unaided observation soon develops a narrow range of preferences, and is not likely, unaided, to expand this by the appreciation and enjoyment of new types. Art embodies the observational inheritance of the race. The æsthetic function of art in public education is to open a broader range of beauty to the individual, to make significant and enjoyable things that otherwise would have remained unnoticed, and to accustom the eye to delight in graceful forms and harmonious colors to a degree that is not possible without some special instruction.

The Demand for Beauty Innate.—Artistic expression appears not only in painting and sculpture but in the forms of necessary articles of use. The demand for beauty in the design and decoration of constructed objects and in every-day surroundings manifests itself as early in human history as the demand for utility. Certain principles of preference in matters of shape and color and arrangement appear to be inherent in human nature. These insure a ready response to the right sort of stimulus, so that some degree of good taste in design may easily be developed.

This desire for design and decoration is insistent, and, if untrained, indulges in profusion of ornament, crude forms, and startling colors in the attempt to find satisfaction in mere repetition of strong sensations. It misses the keen pleasure experienced by those who learn to distinguish between the transitory attractiveness of mere prettiness and the permanent and vitalizing enjoyment

of beautiful things. Standards of taste are not mere individual preferences, but are based on certain elements innate in the constitution of the human mind.

Art is thus called upon to exert its influence in the field of industry by human demands so fundamental that no commercial nation can afford either from a social or from an industrial stand-point to neglect them.

Working Drawings.—One highly specialized form of graphic expression is that of working drawings. So long as constructive work remains simple and the materials inexpensive and easily handled, processes may be carried on by experimenting with actual material and reshaping it whenever necessary to secure the desired results. As soon as problems become complicated and materials expensive, such a method is uneconomical in time and cost.

To meet the demands, a universal language of form has been developed by which processes and results may be accurately predetermined. Diagrams, patterns, and the highly developed conventions of working drawing furnish a medium by which constructive ideas may be carried to detailed perfection and the external world of stubborn materials mastered to a great degree in terms of a language.

History of Art Study in America.—The following statements regarding the history of this subject in American public education are gathered largely from the report of 1880 on American Education in Fine and Industrial Art, prepared under direction of the Bureau of Education, by J. Edwards Clarke in response to a Senate resolution requesting a statement "relative to the development of instruction in drawing as applied to the industrial or fine arts . . . with special reference to the utility of such

instruction in promoting the arts and industries of the people."

In 1749 Benjamin Franklin in his "Proposed Hints for an Academy," recommended drawing as one of the subjects to be taught. In 1821 William Bentley Fowle, an original thinker, but evidently without much previous experience in teaching, became master of a large boys' school in Boston. He introduced blackboards into Boston schools; and on these blackboards and on paper or slates, pupils drew maps and in addition to this use in geography, "linear drawing . . . was made a regular exercise."

As early as 1838, Henry Barnard who was later appointed as the first United States Commissioner of Education, delivered in many parts of the country an address on industrial education in which he urged that drawing be taught in the common schools.

Rembrandt Peale, an artist in Philadelphia, taught drawing as a branch of general education in the schools, from about 1840 to 1844. In Baltimore, Mr. William Minifie taught drawing in 1848 and 1849.

The innovations of Mr. Fowle, Mr. Peale, and Mr. Minifie aroused much opposition among some school officials, and on this account their connection with the public schools as teachers of drawing was brief. However, these and other sporadic cases in different localities were indicative of a growing interest in the subject. Their arguments for drawing were mainly that it supplied a primary need of education. The industrial value of the subject was made prominent but secondary. Later, the industrial argument was made the major consideration by those interested in the matter, and it was on this basis that in 1870 drawing was by legislative enactment

made a required subject in the public schools of Massachusetts. This State at this time secured the services of Mr. Walter Smith from England. He instructed teachers, addressed meetings throughout the State, and became first principal of the Massachusetts Normal Art School. Training schools in different parts of the country were also established, and the supply of well-prepared special teachers steadily increased.

The Centennial Exposition in Philadelphia in 1876 exerted a peculiarly strong influence in favor of public art education. The educational and industrial exhibitions were a revelation to the American people of the possibilities and of their own shortcomings along this line. The movement for greater opportunities for instruction in drawing, design, and industrial work received a fresh impulse.

Recognition of the arts in high school courses has been general during the past decade. The United States Bureau of Education¹ received in 1909 returns from 620 high schools; 572 included fine or industrial art in their courses. In 455 of these schools this subject has been introduced since the beginning of the year 1900. In 258 schools art work is required, and in 319 it is elective.

Free-Hand and Mechanical Drawing and Design.—The values of free-hand and mechanical drawing and design in high school courses are now regarded somewhat as follows: Drawing is the language of form and color and a means of recording observation and experience. In scientific studies, drawing furnishes a convenient means of making graphic and accurate records of obser-

¹ *Bulletin*, 1909, No. 6. "Instruction in the Fine and Manual Arts in the United States," by Henry Turner Bailey, editor of the "School Arts Book."

vations by means of diagrams and correct delineations of form. The student who portrays truthfully the facts which he is studying, not only records his observations, but increases the clearness of these observations. His comparison of facts of structure is more definite because of the necessity of translating these facts into terms of representation. The trustworthiness of the record of his visual sense is increased.

In constructive industries, graphic representation in the form of working drawings has become a specialized means of recording fully and accurately all facts of form and construction. Working drawings may present a perfect record of any sort of mechanical construction. A thorough knowledge of this subject is necessary alike to the architect and to the engineer as a means of embodying his ideas previous to their completion in actual material, and to the workman as an adequate guide to correct execution of these ideas.

In the form of free-hand sketching, drawing offers to the industrial worker a means of endless experimentation and continual comparison of results, which become a direct stimulation to invention and give opportunity to think out plans and details with great completeness, before he is compelled to deal with actual mechanical processes; to accomplish with pencil and brush in terms of patterns, plans, and sketches much tentative work that would otherwise have to be undertaken with expensive and stubborn materials.

Where design is an important element, free-hand drawing furnishes the worker a method of experimenting with different arrangements of patterns and outlines, as in architecture, printing, ceramics, textiles, and other industries, where good proportions, harmonious coloring,

and beautiful outline are demanded equally with utility. This practice reinforced by acquaintance with examples of fine design develops an appreciation of standards of excellence in constructed objects.

Free-hand drawing also offers a means of representing ideas pictorially, either by rapid sketches, or by finished drawings which imply a somewhat thorough study of form, perspective, light and shade, and composition. The pupil thus gains experience in interpreting the visible world into terms of pictorial expression. In doing so, he is compelled to analyze his visual impressions; to decide what are the characteristics of objects or scenes which, if reproduced, will represent the impression. He learns to distinguish between those things which are significant, and the details which, though present, have little to do with the general effect. If the right sort of attention has been given to this subject in elementary grades, the average standard of attainment in high schools advances beyond what is generally supposed possible. Results prove that special talent is no more a factor to be reckoned with in those phases of the arts which appear in public schools, than in the mathematics, music, and literature which are there presented. Though one may produce very ordinary work in free-hand drawing, the study of form and matching of colors which are necessary to representation, however crude, increases one's understanding and enjoyment of nature, and proves an effective introduction to acquaintance with the fine arts, because it deals with the same means of expression that the artist uses.

Instruction in design has as its aim development of good taste regarding the things which constitute everyday environment, a knowledge of the most artistic prod-

ucts of common industries, and acquaintance with examples of good sculpture, architecture, and construction, not simply in ancient productions, but also in such modern applications as local industrial products, in styles of design which relate to private homes, inexpensive as well as otherwise; in the best modern solutions of such problems as public buildings, railway stations, bridges, parks and their accessories, streets and street fixtures, fountains, etc.

A comparison of typical high school courses shows that drawing from traditional still-life groups of objects, accompanied by criticism regarding general technical excellence from the point of view of an artist, is being largely superseded by lines of work planned definitely to meet the general and particular needs of the students.

Courses in Drawing.—While courses differ in various localities, they usually include in some form or other the following:

1. Training planned to give further development in a line, the foundation for which should be well laid in the elementary schools, namely, a mastery of such illustrative or descriptive drawing as does not require special talent, but does give to the person of average ability power to use drawing with some degree of accuracy and facility as a means of common expression. This implies ability to sketch rapidly with what might be called "conversational drawing" where the purpose is to convey ideas. It implies also such drawing as is valuable in connection with the sciences, where the purpose is not pictorial effect, but accurate record of observation and correct delineation of facts.

2. Intensive work in drawing, painting, and modeling, for those who are especially interested in actual

practice either because they plan to continue their studies in art schools or because the work is a matter of general interest on account of the insight it gives into the field of art and the beauties of form and color in nature.

These more intensive courses generally include:

Object drawing, for the sake of ability to represent proportions, solidity, and texture of objects by means of line, light, and shade, values and color.

Figure sketching for the sake of action and proportion.

Plant drawing to express the grace and beauty of natural forms.

Landscape sketching, to interpret effects of nature, and to lead pupils to discover, in the complexity which nature presents, the few significant elements which produce the impression. Landscape study is frequently supplemented by the use of the camera in searching out good compositions and fine interpretations of familiar localities.

Some courses supplement practical work with illustrated lectures and required readings which aim to give a broad survey of the development of art, some idea of its meaning, and a degree of response to its appeal.

3. Working drawing, which aims to develop ability to present, by means of the accepted conventions of the draughting room, complete and accurate information regarding simple forms of construction. This implies a knowledge of instruments and terms, some practice in orthographic projection, and a thorough mastery of free-hand sketching of working drawings with dimensions, and of perspective appearances.

An increasingly clear distinction is now being made between mere instrumental drawing which may present im-

pressive results, and yet require little practical knowledge beyond the mere manipulation of instruments, and the ability to make free-hand sketches which embody all necessary information, and which may at any time be translated into finished instrumental drawings. Consequently, classes in working drawing are giving more attention to that free-hand drawing in terms of which the first stages of most constructive thinking are expressed.

4. Such general work in design as shall develop good standards of taste in those things which make up the furnishing of homes and ordinary surroundings, and, also, more complete courses in constructive and decorative design, in recognition of the increasing demand of the commercial world for competent workers in industrial art.

This may well be intimately associated with the problems in connection with the department of household arts, with local industries and their artistic history and possibilities, and with the civic art for which every community finds a need. A person sufficiently educated to know how the Acropolis or the Roman Forum appears should know, as well, how the various civic features of an American community might appear under wise planning.

Preparation in Elementary Schools.—Opinions from a number of high school instructors in drawing indicate that the most desirable preparation which elementary schools can provide is as follows:

1. Ability to make with lead pencil sincere and truthful representations of simple objects so as to show general characteristics, correct proportions, and typical effects of foreshortening and solidity, and, in natural forms, the growth, structure, and shape.

2. A habit of using rapid, general descriptive drawing.

3. Appreciation of good proportions, of the simpler forms of natural and conventional beauty, and of color effects; ability to match given tones with water-colors, and to lay flat washes of color.

4. Ability to take trustworthy measurements, to make and use patterns and simple working drawings, to use the more common instruments, such as rule, compass, T-square, and triangles, and to print readily and free-hand a good alphabet.

5. A general sympathetic attitude toward art.

Place of Drawing in High School.—The tendency in high school courses in drawing appears to be toward making it a required subject in the first, and often in the second year, and optional afterward, except for students who are planning to attend normal schools. For these it is frequently required during the last year. The amount of time ranges in general from two to five periods a week. Many schools grant the same credit as in the other unprepared subjects. The usual maximal allowance for credit appears to be two units.

Importance of Drawing in Mechanical Pursuits.—Ignorance of the influence of the arts of design upon the industrial progress of a country, and the persistence of traditions to the effect that a practical use of drawing requires special talent, and that response to the influence of art is possible for only a few, have, in the past, been serious obstacles to the progress of art in general education. There is now a growing realization that it is practically impossible for any State to maintain eminence in the higher manufactures if the great body of workmen in other countries are better skilled in the arts of design.

To quote from statements in the previously mentioned

report of the Bureau of Education: "In all matters of construction, in the widest sense of the word, it (drawing) takes the place of a knowledge of reading and writing in the other concerns of life, and is indispensable for giving and receiving intelligible ideas. A mechanic who is without it will almost always be subservient and inferior to one who has it, but is his inferior in most other respects.

"Drawing is the language of mechanics, and ability to use the pencil freely lies at the foundation of success in many mechanical pursuits."

Development of Public Taste.—Experiments on a large scale indicate also that good taste in matters of design, and a high degree of enjoyment of beauty in nature and in art, may be definitely developed in the majority of people.

The scientific and industrial values of drawing and design are easily seen when attention is called to them, and recognition is readily accorded to them. Less obvious, but no less real, are the possibilities of opening up the realm of æsthetics to the majority of people by means of these subjects, and thus of presenting a new field of experience and enjoyment and furnishing an appropriate response to those fundamental desires for beauty which insist on gratification and seek it in gaudy appeals to sensation if not led to know the actual sources of satisfaction.

Training of the Teacher.—The personality and training of the instructors are frequently more important factors in advancing the status of drawing in high schools than formal arguments as to its value. One serious obstacle has been the frequent narrow specialization in preparation which results in a lack of appreciation of the possibilities of the situation and a tendency to make

all pupils conform to given methods and work toward a single end.

Technical training is the first qualification for an instructor and should be thorough and include not only advanced practice in drawing and painting and design, such as a complete course in a good art school furnishes, but also some experimental acquaintance with constructive processes in wood or metal.

The high school teacher of art should also be familiar with the history of education in general, the place high schools occupy in the educational system, and the more important general problems of high school education: how they differ from those of elementary schools and also from those of colleges or of special schools, as, for example, of art schools. He should also know the history of his own subject, its place in education, and its relation to the life of the community.

Especially should he be familiar with methods of educational experimentation so that he may face his work as a scientific problem and investigate it in the light of results. In this way only can he add definitely to his knowledge of the ways in which ability to draw is most readily cultivated and made usable, and of the methods by which æsthetic appreciation is developed.

CHAPTER XVII

MUSIC IN THE HIGH SCHOOL

CHARLES HUBERT FARNSWORTH

PROFESSOR OF MUSIC, TEACHERS COLLEGE, COLUMBIA UNIVERSITY

"Education," as President Butler says, "should be a gradual adjustment to the spiritual possessions of the race," and a music course fails utterly if it does not give the student such an adjustment with reference to music, not only increasing his capacity for making music, but, even more important, heightening his enjoyment of what he hears, whether in the street or home, church or theatre.

Music Courses in High Schools.—Music courses offered in high schools may be roughly grouped under three heads:

1. General chorus work, to which one period a week is given, where the entire school unites, required of all, demanding no knowledge or skill, and for which no credit is given.
2. A chorus period, supplemented by a class lesson, where some technical knowledge connected with sight singing, tone production, and interpretation is attempted. No standards of entrance requirements are demanded. The work leads to no credit and is generally compulsory.
3. Elective courses in harmony, occasionally counter-point and musical history, tending sometimes toward appreciation, and voice study.

These classes are small in number, are conducted like ordinary school work, with requirements both for entrance and promotion. The work is sometimes credited for college entrance, but more often it has recognition as one of the elective subjects.

It will be seen from the above description that high school music is not in the true sense a study; it makes no demands for entrance, nor does it reach any definite goal. It is primarily a musical practice for the social and æsthetic benefit of the exercise.

What Should the Course Be?—Let us consider what the musical course of a high school should be, classifying it under five varieties of musical activity.

1. Chorus work—sight-singing.
2. Appreciation courses.
3. Elective courses in harmony, composition, form, and history.
4. Glee and instrumental clubs.
5. Private work done outside the school.

First, there should be chorus work, generally known as sight-singing. Unlike the medium of poetry, musical beauty is expressed by sound-groupings, unique in this subject; hence the appreciation of the beauty of music is dependent upon the power of discriminating tone differences. This is primarily a mental act, depending largely upon a retentive tone memory. No form of exercise so develops this power as the practice of singing from notation. For when this is done the student is forced to think tone relationships before he hears them, thus developing the power of forming a tonal image. This power is so important in musical development that in such great conservatories as that of Paris, all the instrumental players as well as students of composition

are required to take exhaustive courses in sight-singing. Such a course does not in itself have æsthetic value, but as a means for sharpening the perceptive powers it is perhaps the most intensive work that can be done and should form the backbone of general musical training.

Music Compared with Other Art Subjects.—Comparing music with the other subjects that have to do with training in æsthetics, or the love of the beautiful, we find somewhat similar conditions. The art training, because of the individual nature of the product of this activity, is better classified than is music, the advanced classes requiring a skill for which the earlier classes prepare. There is, however, a similarly anomalous condition with reference to credit, except in that form of the work which deals largely with mechanical drawing or direct copying, which has special value for science and technical work in terms of college entrance credits. The purely æsthetic function, however, is held in similar estimate to that of music. The individual product in design and pictures develops an ambition for individual effort on the part of the pupil that the collective work in music does not foster. Folk and æsthetic dancing connected with physical training have rich æsthetic possibilities which are seldom utilized. Only a few high schools as yet understand or concern themselves with anything beyond the health aspect of the work.

We have, then, music, art, and physical training as the studies that have æsthetic training as a definite aim. This does not mean that æsthetic values are not recognized in literature, language, and even the sciences, but these subjects have other aims, that of æsthetic value being incidental and depending on the personality of the teacher.

The Spirit of Modern Teaching Wrong.—If we consider the five categories, scientific, literary, æsthetic, institutional, and religious that the child is entitled to, it will be seen that the training for the love of the beautiful holds a very large place in an ideal plan of education. When we compare this with the paucity in time, in teaching force, in worth given to the subjects by credits in units, or by insistence on preparation and work done, the discrepancy between the demand of the theorist and the result in actual practice becomes striking. If, further, we consider the spirit of the work the contrast becomes even stronger. "It becomes absolutely impossible for us any longer to identify education with mere acquisition of learning; and we begin to look upon it as really the vestibule of the highest and richest type of living, a gradual adjustment to the spiritual possessions of the race."¹

Are the languages, the sciences, and literature, practically all that is studied of the above list, taught as a "vestibule of the highest and richest type of living"? Or are they taught as college entrance subjects, subjects that will provide discipline and can be measured?

We have here the gist of the whole matter. We see why the æsthetic element is so crushed out of the ordinary subjects, and why, in those in which it is the main factor, as in music and art, the æsthetic stress itself is slurred, or else omitted, as of little account in any case.

How the Teaching of Music May be Improved.—A radical improvement can be made in the teaching of music in high schools when a change can be brought about in the fundamental attitude with reference:

1. To the value of the study of the beautiful.

¹ Butler, N. M. "The Meaning of Education," pp. 16 and 17.

2. To that form of study which, instead of laying stress on formalism and mere discipline, puts it on interest and instinct for evaluating; puts emphasis not so much on the causal relations of what is studied as on the value to the individual.

Prejudice against the Study of *Æsthetics*.—The prejudice of the educational world for those forms of study which are disciplinary in character and deal with the acquisition of facts, such as the languages, the sciences, and mathematics, is but a manifestation of a tendency of our whole social life. We look on serious work as dealing only with those subjects that are quantitatively causal and can be measured by what they do. We consider it worth while to study for a better pursuit of "Life and Liberty," but not of "Happiness." We do not consider those subjects whose value is in the immediate pleasure awakened as worthy of systematic training. So strong is this prejudice in our educational organization that even the teachers of art and music, in the degree to which they are talented and serious, attempt also in their work to treat their subjects as disciplines for acquiring a technic rather than exercises as affording an opportunity for that intimacy of possession which is the mark of *æsthetic* attainment.

There is an evident tendency to misjudge such work. The thorough-going musician is apt to consider it the most important factor in music teaching; on the other hand, the schoolman who views music for its social and *æsthetic* value is impatient with work that is so technical in character, constantly preparing for the enjoyment of the beautiful, but rarely attaining it. It is because of this misjudgment that the work stands in such an anomalous position in high school courses.

Standards of Musical Preparation.—One would naturally think that such peculiarly technical work would require preparation in order to allow students to enter advanced classes, and yet, the country over, there is hardly a school that would debar a student from entering a class in music because he was not prepared for it; if classified by other subjects, he would naturally enter it. The almost universal lack of definite knowledge of music after eight years of work in the lower schools is a constant surprise to those who have investigated the subject; and yet this is not at all to be wondered at when we recall that the high school has no standards for musical acquisition. If the ability to sing is entirely lacking, at least the student should be able to explain the signs used. Students entering without preparation should be required to make up the work. The subject should be treated as any other technical subject in this respect. There are many schools where music is not thoroughly taught, and for pupils from these schools the high school must make adjustments; but where music is adequately taught, at the end of the grammar school period, pupils should be able:

I. To sing musically and with evident intelligence; that is,

1. With artistic method, requiring such features as:

(a) Agreeable tone, }
(b) Correct phrasing, } implying breath control.

(c) Feeling for the spirit, tempo, and character of the song, implying practical knowledge of the common marks and terms by which these are suggested.

2. With evidence of some acquaintance with good music, vocal and instrumental; because they have memorized a large number of song-gems and have associated with many selections the story of their origin.

II. To sing at sight and handle the rudiments of musical structure; that is:

1. With ability to read:

(a) A part in a three or four-part tune, such as one by Dykes, Barnby, or Sullivan.

(b) Eight-measure melodies.

(c) All time-signatures, with the use of one, two, three, or four tones to the beat, unequally divided beats, and syncopation; and key-signatures, major and minor, with either the F-clef or the G-clef, and also the signs for chromatic tones.

2. With ability to write in staff notation from dictation a simple melody, showing the power to analyze what is heard:

(1) As to the union or division of beats,

(2) As to the grouping of beats into measure-patterns, and,

(3) As to the pitch-relationships in the key, major or minor.

A full discussion of these standards may be seen in the "Proceedings of the Music Teachers' National Association for 1908."

Chorus Work and Sight-Singing.—Two important things are developed by such work:

(1) Tone thinking, and

(2) A knowledge of notation which gives access to the literature of music.

If the full æsthetic value of chorus singing is to be attained it is of the utmost importance that the music selected should be the gems of the art; and these should be memorized and so learned that they can be enjoyed after the student has left the school. Unfortunately, the desire to perform ambitious works, such as oratorio cho-

ruses, not only strains the voices by the extremes of pitch and power that such works generally demand, but after the student has left the school he is able to reproduce his pleasure only as he becomes a member of a chorus where such works are given.

If, on the other hand, more attention is paid to unison songs, where associations can be made between the text and the melody, the student will have within his own power of reproduction beautiful works, thus adding to his racial inheritance in song the rich association of a joyous youth.

Plan for Chorus Work.—The following plan is suggested with reference to chorus work. Let there be one gathering a week, covering one period, at which choruses and musical works prepared in the classes should have either a final presentation, or a dress rehearsal. This period should be considered not as a practice period, but as one of the social functions of the school, occasionally including speeches, addresses, and performances by artists and visitors. This should be the hour for especially invited guests and friends of the school. Production at this time should furnish the much-needed motives for the work done in the organizations and classes.

Supporting this hour should be a full period of practice each week, in sections small enough to have the individual work followed up. There should be a second hour for the first and second-year high school students, occupied primarily with practice in sight-singing and ear-training, going over the ground covered by the grammar grades and giving an opportunity for those who have had no music to get sufficient facility in the rudiments to take part intelligently in the choruses.

Both the practice period supplementing the general

musical gathering and the extra hour of drill in sight-reading, required of the first and second year, should be conducted as we conduct any other subject, and receive similar credit. While there are some who cannot carry a tune, so there are some color-blind people. For such it may be necessary to make special adjustments, but in most cases the value of the work is sufficient to allow such few cases to go on with the class. These can certainly learn the few facts and principles which it is necessary to master in connection with sight-singing. The intellectual part even a stone-deaf person could learn in a few hours of serious study.

The justification for requiring every one to undertake the sight-singing discipline lies in the fact that music is one of the most social of all arts. Through the voice every one can participate in an artistic production to an extent impossible in any other art. Music, more than any other form of æsthetics, is the art of our time. Also, it is the only art whose forms have no objective existence. The slight discipline in tone discrimination that sight-singing demands, as has already been insisted upon, finds rich compensation in the increased enjoyment made possible, and justifies the hours spent, the credits given, and the standards required, all of which is necessary to put the study on a serious educational basis.

Appreciation Courses.—While sight-singing is of the utmost value in developing the power of tonal thought and gives acquaintance with songs, its outlook upon musical art is comparatively narrow. Few of the many works even of vocal art can be studied in the intensive way that the reproduction of them in chorus would demand. The broad field of instrumental music, besides large portions of the vocal art, never come within the

horizon of the pupil, hence a second class of work is recommended giving a less intensive, but much broader, view of music. Such courses are generally called appreciation courses, sometimes observation courses. It might be simpler and nearer the truth to call them acquaintance courses, the main object being to bring the students in touch with the master compositions of the art. Such work would have been almost impossible ten years ago unless the teacher were a brilliant player and singer, but with the wonderful advance in recent years in the means of reproducing music a whole new field of education has been opened to the music teacher. It would be absurd to say that because the pupil was not producing the music himself he was getting little value from listening to it. Our whole enjoyment of literature as an art (the art of individual reading having little to do with it) is similar to the enjoyment of music by means of something that produces it for us. Shakespeare, for example, does not have to be acted to be enjoyed.

No adequate standards of this kind of work have been established as yet. Some dwell on the historic and human connections of what is being heard, others go into the analysis of the form, but perhaps the most valuable for the general public and at the same time the simplest to manage so that a genuine æsthetic value shall result, is to have the students hear the works a sufficient number of times so that they will be able to whistle or hum the important themes.

Importance of Knowing Musical "Motives."—As music is an organic creation, generally based upon a few striking motives, to learn these motives so thoroughly that they can be readily recognized and associated with the works to which they belong, would give the result to the student

in a nutshell, and would guarantee the most intelligent enjoyment when these works were heard from great orchestras and choruses. Not that some attention, both as to human interest, form, and structure, should not accompany such work, but the pupil should be able, when asked if he knows the G-minor Fugue of Bach, to have naturally springing into his mind the rollicking theme, rather than the fact that the fugue has subject and counter-subject, stretto and pedal point.

Plan for Appreciation Courses.—Such work demands a room with instruments for reproducing music both instrumental and vocal, and a library of music, rolls, and discs; and a thorough organization of the students so that the room can be continuously used by small groups. The result of the time thus spent will enable one to whistle, to sing, and to recognize the principal themes of compositions. This will mean one hour a week of work tested and enriched by the teacher, and one hour of individual preparation by the pupil. In this work the teaching staff of the school can be largely utilized. Indeed, it will give them a most enjoyable opportunity of becoming acquainted both with good music and with their own pupils, through the joint effort to appreciate discriminatingly the beauties of masterpieces. The work when so accomplished should be credited as part of required æsthetic work for graduation. Similar work in any other art may be substituted where talent and taste indicate the wisdom of such elective principle.

Mr. Edward B. Birge, in charge of the music in the Indianapolis schools, is introducing mechanical players into the grammar grades, and finds that they prove of value in stimulating knowledge and appreciation of music. Lying between the college and the grammar schools is the

high school, where the pupils are at the age for the most effective cultivation of the æsthetic nature.

The demand for one or two extra hours upon the already overcrowded curriculum is justified by the fact that these hours are almost the only ones which are primarily and specifically concerned with introducing the student to the æsthetic inheritance of the race—surely one of the five great aims of education.

Credits.—Credit for this work in melody memorizing, as well as for the course just preceding, in sight-singing, is justified by the fact that both of these activities can be accurately measured and the student's application noted. With some students we do the work with greater ease than with others, it is perfectly true, but this is so in other subjects. It may be granted that musical aptitude aids a student more than aptitude in other subjects, so that some judgment would have to be used in marking for diligence on the basis of accomplishment; but, again, is not this true also of other subjects? Music would simply require a little more care in this respect. Because both of these forms of study are thus measurable, they are not in themselves æsthetic, and they should not be confused, as is so often done when the objection is made to music study, that it is not disciplinary and, therefore, not a credit subject. The objectors are really thinking of purely æsthetic work, and they are right in this contention. On the other hand, when the music teacher declares that his work is as disciplinary as mathematics, he is also right, for he is talking about another aspect of the subject.

While æsthetics is as difficult to teach directly as morals, both have to deal with our valuation of things. The courses indicated above can be made to minister to æsthetic training if seriously treated.

Such comprehensive work in music is justified as well by college entrance requirements. A recent list of the colleges of New England, New York, and New Jersey, gives the following institutions as granting entrance credit for music: Amherst College, Barnard College, Boston University, Columbia University, Harvard University, Mt. Holyoke, Radcliffe, Smith, and Tufts Colleges. Such a representative number of eastern institutions granting credit in music is significant. Of these colleges, four grant entrance credit for musical appreciation; Tufts, for example, not only gives lecture and recitation courses, but also has a well-equipped room with library and rolls, where the student, though not a performer, may familiarize himself with musical literature and thought.

Courses in Harmony and Composition.—A third variety of musical work, which is required for college entrance by some of the more advanced institutions, can be given, consisting of elective courses in harmony, composition, form, and history—such courses being intended only for talented students doing intensive work. These offer little difficulty in their management or in assignable credit units.

Musical Clubs.—A fourth variety of musical work, more important to the life of the school, consists in organizations such as glee and instrumental clubs. Such work naturally attracts the more talented students, and, by giving them a power of expressing themselves, helps them to realize their own talents. In this way the school discovers and develops its musical leaders. At the same time organizations are of the utmost value in the concert and other social functions of the school, widening the possible range of music learned. While the exigency of the programme generally requires that such work be done

outside of school hours, the serious study put into it should be dignified by some form of credit compensation demanding definite standards of application and attendance.

Private Study Outside of School.—Finally, there is the fifth variety of musical activity which the school should recognize and utilize. This is the private work done outside. No small proportion of the pupils who enter the high school have spent a considerable time in systematic piano study. This work has not only been seriously done, but at great expense of both time and money; and yet in many cases this is thrown away because the work cannot be carried on while the pupil is doing the required school work necessary to keep up his class standing. A break of four years in such technical practice is sufficient to prevent most students from doing any further systematic playing. All that is needed is for the high school to recognize at least six hours' practice, with two lessons a week as equivalent to two hours' prepared work in any of the required subjects, such recognition being based on the talent and seriousness with which the work is being done. While the direct control of such work by the high school presents serious difficulties, the talent and accomplishment of students wishing such recognition would be evident enough for school authorities to grant the credit if the principle were recognized. A serious injustice is done the pupil, and a stupid lack in the recognition of educational values is indicated by the present educational policy in secondary education.

Temperament and Training of the Teacher.—The temperament and training of the teacher is of the utmost importance. He must not only have musical ability above the average, but he must also have a genuine love

for the beautiful, which does not always follow. He must have the power of tone discrimination, technical ability, and a broad educational training and human sympathy capable of relating the work to daily, practical experience. The musician often fails in this because his world is such an isolated world of tone. While the college training may hinder a musician's technical ability, it may add an element of culture and human sympathy, making it more worth while for him if he is to become a high school teacher of music.

The teacher's ability to communicate his love and enthusiasm for the beautiful is the point upon which depends the æsthetic value of all that is done. If these qualities are not present, every form of work tends to become technical and formal, while if they are present the simplest scale may be made beautiful and expressive. It is the need of the times to find men who shall lead in pioneer work requiring such nice adjustment of personal qualification and technical training, capable of guiding our youth into the spiritual inheritance of the race.

CHAPTER XVIII

MORAL EDUCATION AND TRAINING, WITH A SUGGESTED COURSE OF STUDY

W. B. ARBAUGH, A.M.

SUPERINTENDENT OF SCHOOLS, YPSILANTI, MICHIGAN

Need of Moral Culture in the Schools.—There is a steadily growing conviction that a larger element of moral culture should be combined with the intellectual training of the school. In recent years no other subject, save that of vocational training, has had more serious consideration in educational circles than the need of increased school efficiency in the development of character. A deepening appreciation of the distinctively purposive character of the school explains, in part, this consciousness of its moral responsibility. Furthermore, the school has not remained uninfluenced by the marvellous moral awakening of recent years, the distinctive note of which is its demand for a return to the fundamental virtues in all the relationships of life.

Importance of Moral Training in Modern Life.—In the modern industrial and social order new and strange situations, calling for fine discrimination and quick decision, crowd upon the individual at every turn. Old and once familiar principles are with difficulty recognized in the complexity of their new setting. The spectacle of moral breakdown under present-day stress and strain has

caused thinkers everywhere to analyze the situation carefully with a view to ascertaining in just what way a system of ideals and values may be made effective in modern life. In view of the essentially practical trend of education at the present time, there is grave danger of over-stressing the idea of productive efficiency in an industrial order, unless, at the same time, character be strengthened and fortified through a living knowledge of fundamental moral and ethical principles. Indeed, it is always to be kept in mind that, while the truly efficient man will also be moral, there is a kind of efficiency which lacks the essentials of morality.

Moral Element in Education Needs Emphasizing.—For a quarter of a century the intellectual element in courses of study, while not necessarily overemphasized, has been greatly stressed. During this same period there has been no corresponding emphasis upon either the moral purpose of the school or the ethical content of the subject-matter of the curriculum. There is a belief, often openly and confidently expressed, that the learner will, unaided, extract from this subject-matter whatever of spiritual truth and moral worth it may have for him. It may be noted here that this is the attitude of those who are opposed to the "pointing of morals." Conviction, strength of character, and rare good judgment are required in the teacher who, when occasion offers, would speak out before young people in no uncertain terms upon the great questions and vital issues of life. The teacher who can thus speak is a power in moulding positive traits of character in the lives of his students. On the other hand, in the effort to avoid the appearance of "preaching," the teacher may cause the moral significance of what he is presenting in a lesson

to be underestimated or overlooked by the student, who inevitably assumes the attitude of the teacher or the textbook.

Some Aspects of the General Problem.—While this chapter is meant to be constructive rather than critical, such aspects of the general problem as are important in their bearing upon later discussion must be mentioned. For this reason it is pertinent to note the decline of certain influences which in the past contributed to the inculcation of fundamental qualities of character.

First, is the home. In the rush and hurry of modern life, many of the simple, essential virtues once fostered by the life in the best homes are in danger of being lost. One does not need to describe nor even to enumerate the conditions that interfere with what is called "home training." The difficulty which well-meaning parents have in devising tasks to fix a sense of responsibility in children, and the interests, attractions, and activities outside the home, which make their appeal to parents as well as to children, suggest phases of the situation both disturbing and perplexing. Nor are all these things compensated for by the broader ethical ideal and active altruism which result from the world-unifying influences of modern inventions and industry.

Again, the attitude not only of the public, but often of the teacher and the school, toward the school use of the Bible and simple Bible truths, marks a decline in the wholesome attitude of an earlier day.¹ It may be that the use of the Bible in our democratic public school is

¹ The recent introduction of the Old Testament narrative in the College Entrance Requirements in English is not to be understood as marking a return to Bible study in the school. The Bible text is to be read as literature, and any attempt to enlarge upon or explain its religious teachings would, in most places, be barred.

not practicable. This would seem to be so unless constitutional restraint be removed. However, because the teaching of religion, in the sense of instruction in dogma, is forbidden, all reference to a higher life and such subjects as God and immortality is too often omitted by teachers in the course of other instruction. As to the effect of such an attitude, one writer¹ says:

"Silence regarding an issue is, in fact, often the surest way of throwing influence in favor of a negative solution of it. . . . Religion or irreligion is present in the schools just as surely as teachers are present. . . . In the regulation of conduct; in the study of literature, biography, history, and nature; by incidental reference here and there, especially as all these are reinforced by the teacher's own tone and manner of life, it is easy to make the child realize that the school respects that which his parents and his church hold most dear. Without at least thus much religion in the school, we cultivate a divided self in the pupil. He lives in several different worlds, between which he experiences no unity. . . . The primary necessity, then, is that the school should take religion for granted."

One cannot enter here into a full discussion of the subject of religious education and training. However, the vital relationship not only between religion and morality, but between these and other factors in education, cannot be ignored. Nothing could be more important in educational practice than the recognition of the essential unity which these factors constitute and which makes the terms, "religious," "moral," "vocational," etc., inapplicable and needless. The fallacy underlying a dissociation in theory and the necessity following their

¹ Coe, G. A., "Education in Religion and Morals," pp. 352 ff.

separation in practice have recently been stated as follows:

"In the English-speaking world, secular education became popular through a misunderstanding. Most of those who advocated it imagined education to be a faggot of different 'subjects,' out of which you could pull the stick called 'religion' without any serious loss of kindling for the fire. . . . If you leave religion out of the work of a school, you have to find some substitute for it. A school is not a purely intellectual workshop. It is a community in which the emotions are stirred, the imagination quickened, ideals of life imparted. . . . Experience has shown that a school must address itself to the task of influencing conduct and shaping character. In order to do this it must have a philosophy, implicit in its influence, explicit in its course of instruction."¹

In the preceding paragraphs the problem could be stated only in its main outlines. In nothing that has been said, however, is it implied that the whole task of character formation is to be assumed by the school. Indeed, the magnitude of the intellectual task imposed upon the school makes this impossible. Yet with all that may be accomplished through other agencies, there remains much which can best be achieved through this means. What is needed is a more profound appreciation of the moral duty of the school, and a full recognition of its character as a socializing agency. Through the school mainly can the individual be expected to arrive at anything like an adequate understanding of the significance of the larger relations of mature life. The importance of this can hardly be overestimated, for "social

¹ Sadler, M. E., "High Church Men and the Crisis in English Education," *Contemporary Review*, 98 : 257.

knowledge is the basis of morality." "We live in a system, and to achieve right ends, or any rational ends whatever, we must learn to understand that system."¹

Methods of Instruction.—The general agreement upon the necessity of increased attention to the moral element in education has already been noted. Most of the discussion of recent years has centred about the question of method. The terms, direct and indirect, as applied to instruction in morals and ethics need little explanation. The former implies the use of precept, the study of the principles of right action, and the examination of motives and ideals in conduct. The latter, sometimes called the incidental method, has reference to the use of the organization and the activities of the school, and of the moral and ethical implications of the regular school subjects. Specifically, the former aims at supplying moral conceptions and insight; the latter adds to incidental instruction training, in the sense of formation of right habits.

To the method of direct instruction many objections are offered. It has been suggested, for example, that morality is not a matter of knowledge, but rather of habits formed during growth and adjustment "in some sort of moral world."² Again, it is argued, weakness of will, which no amount of instruction in ideals of conduct can strengthen, is at the bottom of much wrong-doing. There is further objection on the ground that such instruction easily degenerates into "moralizing," which either passes over the head of the pupil or palls upon him, leaving no results in conduct. Still other objections are based on the ground of the danger of morbidness and

¹ Cooley, C. H., "Social Organization," p. 21. See, also, Chancellor, W. E., "Motives, Ideals, and Values in Education," pp. 27 ff.

² Palmer, G. H., "Ethical and Moral Instruction in Schools," p. 9.

moral precocity, which might result from too early examination and criticism, on the part of the pupil, of his own conduct and that of others.

On the other hand, those who favor making use of direct instruction, while not opposing the use of incidental means, regard the latter as inadequate and, at best, as too likely to be neglected in the regular work of the school. It is urged that present-day moral laxity is due in part to the school's neglect of instruction in morals, and that if right ideals of personal conduct are to have influence in maturity there must be conscious and unremitting effort to establish these early in life. A further argument in favor of direct instruction is adduced from the thoughtlessness or ignorance to which much wrong conduct is due. A cure for this, it is believed, will be found in the quickening, through instruction, of moral insight or perception.¹

In this question of method there is much confusion in the use of terms. Most of those who oppose direct instruction have in mind such extreme formalism as characterizes the classic illustration from the *Emile*. It need hardly be said that no one could be found so devoid of reason and judgment as to practice or defend such procedure. On the other hand, the number of those who believe in rational, systematic instruction in questions of social relationships is increasing. Fortunately, while the distinction between the two methods may be clearly drawn in theory, practice need not be confined to either method exclusively. The true teacher will have such a

¹ An excellent brief statement of the pros and cons of direct moral instruction is to be found in "Moral Instruction and Training in Schools: Report of an International Inquiry," edited by M. E. Sadler, vol. I, chaps. II-VI. Chap. II presents in concise form, also, some of the scientific aspects of the whole subject.

conception of his work as will enable him to use wisely whichever one occasions demand. "Every man in every work needs some such controlling idea under which all details of method can be harmonized. It keeps the largeness of a man's labor. It saves him from the danger of first thinking there is only one way to do his work, and then narrowing his work to the possibilities of that single method."¹

Passing from general aspects of the subject in its relation to schools of any grade, we may now deal directly with the high school, and especially with methods of procedure there. Much importance has always been attached to the moralizing effect of the organization and work, and the life and interests of the school, and to the personality of teachers. It is doubtful, indeed, whether there has been full recognition of the moral value of these agencies. In actual practice there is too little conscious effort to utilize them to the best advantage. The test of the teacher's fitness has in the past been measured too largely by his scholastic attainments or his ability to prepare students to pass examinations. Furthermore, the life and interests of the modern high school are in themselves complex, and easily become demoralizing influences if left to themselves, as is likely to be the case under present conditions.² It is clear that there should be a better utilization of incidental means for training

¹ Phillips Brooks, "Essays and Addresses," p. 41.

² As an example, note the practice, sometimes resorted to by salesmen, of gratuitously supplying pins or invitations for the personal use of those who have in charge the purchase of these articles. This is the beginning of "graft" or "rake-off." The insidious manner in which such temptations come makes them all the more dangerous, while the practice itself is opposed to the idea of service, which should permeate all life as well as the instruction of the school. Those familiar with social activities and athletics in the high school know of many such antimoral practices.

in character. Through the activities of a well-regulated school, habits of response to moral situations, a sense of responsibility, and an appreciation of the meaning of social interdependence should be acquired naturally. Too much emphasis cannot be put upon the school as a social institution in which preparation for life is taking place through all of its actual, concrete relations and activities.¹

In this brief consideration of incidental means the term, training, was purposely used to refer to habits of response and conduct, which these means cultivate. There is, however, a conviction, well-founded, that indirect training is inadequate, that the results are unsatisfactory. This conviction is expressing itself in a demand that the high school shall give also specific instruction in moral matters. This need not be rigidly interpreted as instruction in ethics, although this, as will appear later, may well have a place in adolescent education. Much material already in the curriculum is rich in ideas which have great moral value for instruction in social and civic questions. That this material should be so used, it is necessary merely to call attention to the need to-day of such intelligence and conscience in civic matters as will lead the individual to think as highly of public duty as of private right. Again, the innate ambition of youth should be utilized in establishing standards by which to measure success, in giving counsel and guidance in the choice of life vocations, and in instilling ideas of social obligation.

There is a further reason for specific instruction in the principles of right conduct. Training, which is the result of participation in the life, not only of the school, but

¹ Cf. Dewey, "Moral Principles in Education," pp. 5 ff. Also Henderson, "A Text-Book in the Principles of Education," pp. 412-414.

of the larger life outside the school, manifests itself in habits and characteristic attitudes. These, however, do not function unless a stimulus is present, and, in conditions that are constantly changing, the original stimulus may be lost. Hence, "morality is not all habit and emotion. Conscientious conduct implies not only doing the right thing when we know it, but finding out the right thing to do. Conduct that is mere habit is not real moral conduct; 'Good habits' need constant revision for growing persons and changing society."¹

Knowledge, also, would thus appear to be a requisite for genuine moral conduct. Even this without the element of will is not a guarantee of right action.² But, assuming the importance of will, it must be said that knowledge has a large place. So, in addition to instruction in morals more or less indirectly through other subjects, instruction in elementary ethics as the science of right action should be undertaken by the high school. The complexity of modern life often makes not only apprehension of moral truth but discernment of moral obliquity difficult. Actual confusion and perplexity is thus responsible for much wrong-doing. Most of such instruction should, doubtless, be deferred to the last high school year, although teachers should never hesitate to state clearly the conditions of ethical situations as they arise. Before students leave the high school, they have reached the period of later adolescence, when instinct and habit have risen to the higher level of reflective life. At this time examination of some of the standards and ideals which society has established for its members may

¹ Tufts, J. H., "Is There a Place for Moral Instruction?," editorial in *The School Review*, 16 : 476.

² Cf. Horne, H. H., "Idealism in Education," p. 137.

well be made. Such specific instruction should be skillfully and tactfully given. There should be regular weekly recitations throughout the year, or daily recitations for a term, preferably toward the end of the year. This would seem to be sufficient time for the presentation of such material as is available. Because there are yet no text-books well adapted to the purpose, the subject will have to be presented orally by the teacher. There are, however, a few books of merit which may be used as parallel reading.¹ A compilation of ethical readings of acknowledged merit compiled from modern sources would serve a useful purpose in further supplementing instruction. In the absence of such a compilation, personal guidance in reading selected portions from ethical literature will be found practicable. Reports by students upon assigned topics can be discussed, the discussion being wisely directed by the teacher so that definite conclusions and principles may be reached. Further difficulty will be met in finding, in the regular corps, a teacher fitted in temperament, training, and experience to give such instruction. Here the necessity of specific preparation of teachers for this work is evident. But limitations should not stand in the way of our doing whatever may be practicable. It has been shown that moral enlightenment presents a legitimate field for high school instruction. There should be an end of abstract discussion as to its feasibility. The first steps may be halting; a body of principles will have to be worked out, and this can be done only through experimentation and practice.

Programme of Study.—A proposal for moral and ethical instruction is given below as a tentative programme

¹ Probably the best attempt in the direction of a text-book is J. N. Larned's "A Primer of Right and Wrong."

of study. Related topics, not previously mentioned in the discussion, are included. Further topics and suggestions will be found in several of the titles mentioned in the bibliography at the end of the book. Much of the work suggested may be carried on incidentally through such subjects as history and English composition. A full recitation period once or twice a week may be allotted to elementary civics, elementary ethics, and related topics.

FIRST YEAR.—A. Service. (Instruction through assigned readings, discussion, and composition.)

1. Public Service.
 - a. The fight against disease.
 - b. The fight for pure food.
 - c. The fight for clean streets and better dwellings.
2. Service through Vocation.
 - a. Value of a deliberate choice of life vocation.
 - b. Danger of too early choice.
 - c. Essential qualities demanded by various vocations.
 - d. Contributing service through vocation.
3. Service a Measure of Success.
 - a. Conditions and meaning of success.
 - b. Biographies of successful men and women.

B. Obligation. (Instruction through assigned readings, discussion, and composition.)

1. Of the individual and of society to the past, especially to writers and inventors and to pioneers in education and industry.
2. Of the student to the community and the State.

SECOND YEAR.—A. Elementary Civics.

1. The community and community life.
2. The family and the community.
3. The individual and the family.
4. The individual and public health.
5. The duty of social and public service. Why the individual should be interested in

- a.* Public schools.
 - b.* The slums.
 - c.* Social settlement.
 - d.* Public charities.
 - e.* The church.
- B.* Studies in Present-day Moral Leadership. (See Bibliography. Accounts of the work of social and political reformers and leaders to be found in magazines and reviews of the past few years will also furnish material.)

THIRD YEAR.—A. Universal Peace.

- 1. National interdependence.
 - 2. Arbitration—national and industrial.
 - 3. Youth, the schools, and peace.
- B.* Modern Justice.
 - 1. Newer methods—juvenile courts, etc.
 - 2. The prevention of crime.
 - 3. Modern philanthropic movements.
- C.* Studies in Moral Leadership. (Selected biographies.)

FOURTH YEAR.—A. Instruction in Ethics, and Ethical Readings. (See suggestions already given, page 342.)

- B.* Discussion of Ethical Questions.
 - 1. The ethics of modern business.
 - 2. Integrity as an asset in business.
 - 3. Courtesy in business.
 - 4. Employer and employee.
(A number of concrete ethical situations may be gathered from men and women in actual business and professional life. Better still will be the questions that arise in the life of the school. These should be frankly and fairly discussed, and the principles involved clearly set forth.)
- C.* Studies in the Choosing of a Vocation.
 - 1. Review of Service through Vocation and Service a Measure of Success under outline for first year.

2. Study of local vocations with talks by professional and business men.
 3. Study of local opportunities—educational and vocational.
- D. Introduction to the Study of Society.**
1. The structure of society.
 2. Social interdependence.

CHAPTER XIX

PHYSIOLOGY AND HYGIENE

CHARLES SCOTT BERRY, PH.D.

ASSISTANT PROFESSOR OF EDUCATION, UNIVERSITY OF MICHIGAN

Present-Day Interest in Physical Education.—The physical man, admired by the Greek because of his grace and beauty, despised by the Christian because of his worldly desires, is welcomed by the present as having worth in himself, and as being an indispensable means for attaining the æsthetic, intellectual, and spiritual development to which our own age aspires. The doctrine of evolution showing the intimate relation that exists between physical and mental development, and indicative of the broadening of the narrow religious conceptions which dominated the past, are two of the factors which have led to the reawakening of the physical conscience. And this reawakening is shown by the rise and development of preventive medicine and the revival of interest in physical education. Of the sciences which have so rapidly developed since the acceptance of the theory of evolution, physiology and hygiene are the ones most important in the preservation and improvement of health; for without health the highest intellectual and moral development cannot be attained.

“We infer that as vigorous health and its accompanying high spirits are larger elements of happiness than any other things whatever, the teaching how to maintain

them is a teaching that yields in moment to no other whatever. And, therefore, we assert that such a course of physiology as is needful for the comprehension of its general truths, and their bearings on daily conduct, is an all-essential part of a rational education."¹

Physiology and Hygiene in the High School Curriculum.—With this conception of the educational importance of physiology and hygiene let us turn to the discussion of their place and function in the curriculum of the high school. The character of any course offered in the high school will be determined largely by the nature and extent of the instruction given in that subject in the grades. Hence, the importance of a brief review of the teaching of physiology and hygiene in the grades to determine not only how it has been taught, but how this instruction is being modified by the rise and development of preventive medicine and physical education.

Beginning of Movement.—The propaganda for the teaching of physiology and hygiene in the public schools began in 1879 when Mrs. Mary H. Hunt presented to the National Convention of the Woman's Christian Temperance Union a plan for thorough text-book study of "scientific temperance" in the public schools, as a means of preventing intemperance. The character of the movement is shown by the following quotation from one of the publications of the Woman's Christian Temperance Union:

"This is not a physiological, but a temperance movement. In all grades below the high school this instruction should contain only physiology enough to make the hygiene of temperance and other laws of health intelligible. Temperance should be the chief and not the sub-

¹ Spencer, Herbert, "Education," p. 27.

ordinate topic and should occupy at least one-fourth the space in text-books for these grades."¹

The Woman's Christian Temperance Union aroused so much interest in this movement that by 1900 nearly all the States in the Union had enacted laws requiring instruction in physiology and hygiene, with especial reference to the nature of alcohol and narcotics and their effect upon the human system, to be given in the public schools. More than thirty years have passed since the beginning of the agitation for the teaching of physiology and hygiene in the public schools from the stand-point of the evil effects of narcotics and stimulants, and to-day the consensus of opinion seems to be that this instruction in physiology and hygiene has not been a success.

Reasons for Failure.—The reasons for the failure of a movement which promised so much are well worth considering. Richard C. Cabot points out that the teaching of physiology and hygiene in the public schools has accomplished so little:

"1. Because some of it is demonstrably false, and much more of it is not demonstrably true. 2. Because it has been presented not as a fact, but as preaching. 3. Because the individual factors, the differences that make one man's meat and another man's poison, have been largely ignored. 4. Because of a misplaced emphasis on single organs or functions, rather than on the live interests of the child, in relation to which the health of single organs gets its value."² The Committee of the

¹ Billings, John S., "Physiological Aspects of the Liquor Problem," 1903, vol. I, p. 23.

² Cabot, Richard C., "The Teaching of Hygiene," "Proceedings of the First, Second, and Third Congresses of the American School Hygiene Association," 1910, p. 201.

New York State Science Teacher's Association¹ found that some of the reasons why the teaching of physiology and hygiene was not more effective in the schools of New York State were, the dominance of the instruction by legislative enactment, the frequent and unnecessary repetition of the instruction in the various grades, and the too early use of text-books. Some additional reasons cited by Wood² to account for the unsuccessful teaching of hygiene in the schools are, that the teachers themselves are frequently wanting in habits of hygienic living, that they do not possess the practical and scientific knowledge necessary to present this subject in an effective way, that the instruction has been too theoretical, that too much attention has been given to personal, and not enough to social hygiene, that too much emphasis has been placed on disease and not enough on health, and that the text-books contain too much anatomy and physiology and not enough sanitation, bacteriology, and industrial and social hygiene.

But the fundamental reason why the teaching of hygiene and physiology has been so unsuccessful in the grades is that we have signally failed to recognize: first, that right living or the formation of hygienic habits should precede the understanding of the scientific reasons for the formation of such habits; and, second, that instruction to be effective must be positive, not negative. The neglect of the first of these two fundamental principles has caused us to emphasize theory instead of practice. We have sought to give the child a knowledge of physiology

¹ "School Instruction in the Effects of Stimulants and Narcotics," *Educational Review*, vol. XXIV, 1902, p. 45.

² Wood, T. D., "The Ninth Year-Book of the National Society for the Study of Education," Part I, "Health and Education," 1910, p. 63.

and hygiene, forgetting that the Socratic maxim that knowledge is virtue holds only when habits of right living have already been formed. The neglect of the second fundamental principle is most apparent in the so-called temperance instruction. In this instruction we have forgotten that every idea tends to express itself in action, and instead of teaching the child, who is naturally active, what he should do we have, instead, spent much time and energy in teaching him what he should not do. The instruction has been negative in its nature, and, as one might expect, largely negative in its results.

Present Status of Subject.—After this brief review of the teaching of physiology and hygiene in the grades, let us now attempt to determine the existing status of these subjects in the high school. Gulick's¹ investigation shows that only sixteen per cent of two thousand three hundred ninety-two public schools in the United States are giving regular instruction in hygiene. Crosby sent a questionnaire² to seventy high school principals of Iowa. Among the questions asked was the following one:

"Do your pupils like physiology as well as they like other laboratory sciences?" Of those who answered the question only twenty-seven per cent replied "Yes"; seventy-three per cent said "No."

In discussing the teaching of physiology in the high school Crosby points out that "the method of presentation is the same as that in the grades, whereas an entirely new method of approach is desirable. As far as

¹ Gulick, L. H., "Status of Physical Education in Ninety Public Normal Schools and Two Thousand Three Hundred and Ninety-two Public High Schools in the United States," "Proceedings of the Fourth Congress of the American School Hygiene Association," 1910, p. 175.

² Crosby, Clifford, "Physiology; How and How Much?" *School Science and Mathematics*, vol. VII, 1907, p. 738.

my knowledge of the matter goes teachers are doing the physiology work in the grades in about the same way that it is done in the high school. The same threadbare experiments are performed, and the same demonstrations are made, the point of view remaining the same in all grades. Owing to the fact that this process has been going on through several grades, the pupils as a rule are tired of the subject and have little respect for what they have learned."

Crosby found that fifty-two per cent of the schools which answered his questionnaire offered physiology before either botany or zoology, and that physiology was taught during the first year in fifty per cent of the cases reported. A more extended investigation, by Hunter,¹ of the teaching of biologic science in the secondary schools of the United States brings to light the fact that of one hundred and ninety-three high schools offering physiology and hygiene fifty-four per cent of them teach these subjects in the first year, eighteen per cent in the second year, eleven per cent in the third year, and seventeen per cent in the fourth year. In some States the law requires the teaching of physiology and hygiene in the first year of the high school. This accounts, to some extent, for the high percentage of schools offering these subjects in the first year of the high school course. For in Massachusetts, where the law does not specify in which year of the high school physiology is to be taught, of the forty high schools replying to the questionnaire ten teach it in the first year, five in the second, twelve in the third, and thirteen in the fourth. These and other investigations

¹ Hunter, G. W., "The Methods, Content, and Purpose of Biologic Science in the Secondary Schools of the United States," *School Science and Mathematics*, vol. X, 1910, p. 3.

show: first, that the majority of the high schools are not even offering any systematic instruction in physiology and hygiene; second, that in more than half of the schools where the subject is taught it comes in the first year of the high school course, before the pupils have had either biology, chemistry, or physics; third, that it is taught in about the same way as in the grades; and, fourth, that the results are generally unsatisfactory.

However, the situation is not quite so hopeless as it appears to be, because there are, at the present time, certain factors which are slowly changing, and are bound to transform the teaching of hygiene and physiology not only in the grades, but in the high school as well. These factors are medical inspection and physical education.

Medical Inspection.—From the discovery of the bacillus of tuberculosis in 1882 the watchword of the medical profession has been the prevention of disease. To protect the child and the community medical inspection for the detection of infectious and contagious diseases was begun in the schools of New York City in 1892. Since that time the movement has spread rapidly, until now most of our large cities have medical inspection. At first this work was under the control and direction of the Board of Health. The teacher had nothing more to do than to report the cases that appeared to be in need of medical attention. But with the extension of medical inspection to include examinations for the detection of non-contagious defects the school board and the teacher were required to play a more active part. The examinations of school children at home and abroad show that from twenty to thirty per cent of the school children have defective eyesight, that over fifty per cent are suffering from defective teeth, that over five per cent have defec-

tive hearing, and that large numbers are suffering from mal-nutrition, adenoids, and other defects. As a result of the publication of these facts relating to the physical condition of the school child, much interest has been aroused in making the conditions of school life more hygienic, in seeing that the school-rooms are properly lighted, heated, and ventilated, and in instructing the child in hygienic ways of living.

Revival of Interest in Physical Education.—The other factor which is arousing the interest of the teacher in the physical welfare of the school child is the revival of interest in physical education, as is shown by the remarkable growth of athletics and gymnastics in the colleges, secondary schools, and Young Men's Christian Associations, and by the phenomenal spread of the playground movement. The attendance at the gymnasias and athletic fields of the Y. M. C. A. has increased over three hundred per cent during the past ten years,¹ and during the same period of time Mero² estimates that about fifty millions of dollars have been spent in the purchase, equipment, and maintenance of playgrounds in the United States. In fact, the playground has proved to be such an important factor in bettering the physical condition of the children in the poorer districts of the large cities that Massachusetts and Virginia have enacted laws making provision for the establishment of playgrounds in all cities of more than ten thousand inhabitants.

These two aspects of the movement for physical welfare—medical inspection and physical education—are causing the teacher to see that the mental and moral

¹ "Year-Books of the Young Men's Christian Associations of North America" for 1899 and 1908-9.

² Mero, "American Playgrounds," 1908, p. 20.

development of the child is closely bound up with his physical welfare. As a result, more interest is being manifested in the physical well-being of the school child to-day than ever before in the history of modern education.

Present Methods of Organization.—That medical inspection and physical education are beginning to vitalize the teaching of physiology and hygiene is very evident when we consider what is now being done in some of the large cities. In 1907, the School Committee of Boston voted to create a department of school hygiene. The whole department was placed under the control of one director, who has general supervision over all matters affecting the physical welfare of the pupils and teachers. This director has control of medical inspection (except that under the supervision of the board of health), a corps of trained nurses, the teaching of physiology and hygiene in the grades, the teaching of gymnastics, playground instruction, and athletic training of all kinds, both in the elementary and in the secondary schools.¹ St. Louis has recently established a department of school hygiene, and Superintendent Maxwell is using all of his influence to have such a department established in the schools of New York City. The department of physical training in the latter city is attempting to arouse the interest of the child in his physical well-being by giving a certain amount of credit, not only for proficiency in athletics and gymnastics, but also for the formation of hygienic habits. Ward Crampton, M.D., director of physical education in the public schools of New York City, says:

"Instruction should be related to the constantly recurring incidents of daily life, rather than to the structure

¹ "Annual Report of School Committee of Boston," 1908.

of the body, for the child concerns itself with the doing of things rather than with its own bodily composition. Instruction should be practical rather than theoretical, and should be taken from experience rather than from a book. . . . All pupils should be examined in hygiene and marked thereon for promotion. By this I do not mean the ability of the pupil to write down a number of bones in the body or the function of the bile—I mean a mark in practical hygiene; the *mark* that the hygiene authority and instruction of the school have left upon the physical being of the student.”¹

Here we see that in the teaching of physiology and hygiene in the grades the emphasis is placed on the formation of habits of hygienic living and not on the explanation of the scientific reasons for the formation of such habits. It is true that the teacher explains to the child the importance of forming habits of hygienic living. But these explanations must necessarily be adapted to the understanding and experience of the child, and that means that the scientific reasons cannot successfully be given at this stage of the child's development. We have tried that for many years in teaching the facts of anatomy and physiology as a basis for the instruction in hygiene. The result has been that we have succeeded in getting the child neither to form hygienic habits nor to understand the importance of forming such habits.

“We have assumed that one must know the *structure of the organ*, then its function, before one can be in a position to properly care for it. This implies a capacity for learning and an ability to reason far beyond the powers

¹ Crampton, Ward, “The Teaching of Hygiene,” “Proceedings of the Fourth Congress of American School Hygiene Association, 1910,” p. 138.

of our pre-adolescent school population. It implies also an ability to act in accordance with the results of mature consideration which is obviously lacking."¹

But it is not enough to form hygienic habits, important as that is; the youth must know the scientific reasons for the formation of such habits if these habits are to be made permanent in an environment unfavorable to their continuance, and if the youth is to become an active agent in the war against unsanitary conditions. This means that instruction in physiology and hygiene should be given in the high school as well as in the grades. And this is all the more evident when we consider the remarkable increase in the number of colleges and universities which have recently introduced hygiene into their courses of study.

"In 1884 hygiene was taught in 28, or 60.9 per cent, of 46 leading colleges. In 1909, hygiene was taught in 97, or 83.6 per cent, of 116 leading colleges. The most remarkable development of recent years is the placing of hygiene in the regular curriculum as a prescribed subject. Hygiene was prescribed in 47 colleges in 1910. Before 1890 only 6 colleges, or 12.8 per cent, prescribed hygiene. From 1890 to 1900, 10 colleges, or 21.3 per cent, prescribed hygiene. From 1900 to 1910, 31 colleges, or 63.9 per cent, prescribed hygiene. The fact that nearly 80 per cent of the colleges offering regular courses in hygiene give positive credit toward the bachelor's degree for these courses, is further proof that hygiene is now considered an important branch of education."²

¹ *Ibid.*, p. 138.

² Meylan, G. L., "Report of the Committee on Status of Instruction in Hygiene in American Educational Institutions," "Proceedings of the Fourth Congress of the American School Hygiene Association, 1910," p. 173.

If it is so important that the few who go to college should study hygiene it is even more important that the many who attend the high school, but who will never enter college, should have a scientific knowledge of this subject.

Nature of Course.—Then, if it is granted that a course in physiology and hygiene has a place in the curriculum of the high school, what should be the nature of this course? The aim of a high school course in physiology and hygiene should be to give the pupil a scientific knowledge, as far as that is possible, of the principles of physiology, hygiene, sanitation, and physical education, with a view to their practical application. But if this aim is to be realized the pupil must have acquired some knowledge of biology, and should also have studied chemistry and physics before beginning the proposed course in physiology and hygiene. Then, too, the greater maturity of the pupil enables him to pursue such a course to better advantage in the later years of the high school. For if this course is given in the first year of the high school before the pupil has studied biology, chemistry, or physics, as is the case at the present time in the majority of the high schools, it can be little more than a continuation of the work that the pupil has already passed over in the grades. That kind of a course, as we have already seen, is accomplishing but little in the high schools at the present time. However, in some States the law requires the teaching of physiology and hygiene in the first year of the high school. It has been suggested that where physiology must be taught in the first year of the high school it can to advantage be made part of the course in biology. Assuming that the pupil has already some knowledge of biology and chemistry, the subject-matter of the proposed

course in physiology and hygiene should include physiology, bacteriology (which is essential to the understanding of the nature of infectious and contagious diseases), personal and social hygiene, sanitation, and physical education. In the grades the emphasis doubtless should be placed on personal hygiene, the formation of hygienic habits. But the high school age is the period of the development of the social instincts. And now is the time to emphasize social hygiene and sanitation. Let the youth realize that in living hygienically he is doing but half his duty; the other half is to co-operate with others in the struggle to transform an environment unfavorable to the health of the community. The history of the conquest of yellow-fever in Cuba and the Panama Canal zone can be used to advantage in vitalizing the knowledge we wish to impart. For there are few pages in modern history more fascinating and few illustrate more strikingly the power of knowledge than those which tell of man's desperate struggle with disease.

We have already seen that there is a growing tendency in the large cities to place all those interests which relate to the health and physical development of the child in a department of school hygiene. Meylan's investigation shows that there is also a tendency in the colleges and universities "to correlate all the interests related to the physical welfare of the students in the department of physical education or of hygiene and physical education. The activities usually grouped in that department include the teaching of hygiene, gymnastics, and athletics, the care of the students' health and, in some cases, the supervision of the sanitary condition of school buildings, dormitories, kitchens, water supply, and grounds. The further development of this growing tendency is limited only by

the supply of men possessing the necessary character, general education, professional training, administrative ability, and sympathetic personality to properly direct a department of so broad and diversified interests.”¹

It seems no less desirable and important in the high school than in the college to have the same person who teaches the physiology and hygiene have also general supervision over all other interests which relate to the physical welfare of the pupils. In most of the high schools one teacher has directed the work of athletics and physical education and another has taught the physiology and hygiene, each working without reference to the other. The result has been that the teaching of physiology and hygiene has been too theoretical; it has not touched the practical interests of the pupil. But when the teacher of the course in physiology and hygiene is also director of athletics and physical education, the tendency is to place more emphasis upon hygiene and less on physiology. The teacher is more apt to regard biology and physiology as subjects whose prime aim is to teach the pupil how to live. In fact, the playground and the gymnasium become laboratories for applying the principles of hygiene which are discussed in the class room. Here is an opportunity of correlating physical training with mental development in a more thoroughgoing and fundamental way than has yet been carried out in the high schools.

Training of Teacher.—This means, however, that the training of the teacher of science must be broadened to include courses in hygiene, sanitation, bacteriology, and physical training. For the teacher of the proposed course in physiology and hygiene should be as much interested in the practical as in the theoretical side of the subject.

¹ *Ibid.*, p. 173.

But if the teaching of hygiene is to be effective, is to leave its mark on the pupil, not only must the education of the teacher of this special subject be broadened, but the health-conscience of the teacher in general must be aroused. It is just as important for the teacher to feel responsible for the physical welfare of the child as for his moral welfare. The teacher is not employed primarily to teach morals, yet he is required to do all he can to inculcate moral principles and be a worthy example. And surely it is not asking too much for the teacher to receive such an education that he will take the same attitude toward the teaching of hygiene and the practising of hygienic living that he now takes toward the inculcating of moral principles and the living of a moral life. When this point is reached, and not until then, will the teaching of physiology and hygiene be as effective as the nature of the material, the importance of the subject-matter, and the demands of the time require.

CHAPTER XX

SEX PEDAGOGY IN THE HIGH SCHOOL

ALDRED SCOTT WARTHIN, PH.D., M.D.

PROFESSOR OF PATHOLOGY AND DIRECTOR OF THE PATHOLOGIC
LABORATORIES IN THE UNIVERSITY OF MICHIGAN

The Problem.—The most remarkable paradox of our civilization is its attitude toward the most important thing of life—the reproductive function, about which centre the most vital interests of the individual and of the race. Over all things concerning sex there has been thrown an unholy veil of mystery and concealment, reticence and prudery; and from this strange taboo conditions have been gradually developed that now threaten the very foundations of our society in the shape of disease, white slavery, disintegration of the family, divorce, and race suicide. Never approached as things sacred or holy, matters of sex have been relegated by the modern world to the background as unclean, to be referred to discreetly, or with double meaning, or to be made the subject of vulgar jest or suggestion. For this state of things parents have been primarily to blame. Certainly theirs the duty, if any one's, to bring up children in full knowledge of their bodies and of the meaning of life; and to prepare them to escape the frightful dangers that sexual ignorance entails. But the average parent evades this sacred duty as a thing too delicate for sober discussion, and the boy is left to gather from all possible sources,

most of them improper, a distorted and imperfect knowledge of sexual matters, only to learn from his own bitter experiences, when too late, that his parents have betrayed him in not preparing him fully to meet the problems of the sexual life. This great failure of parents to give the most needed aid to their children has been all the more paradoxical in a generation which has so vaunted the value of knowledge and education along all other lines of thought. From this one path modern society, particularly the Anglo-Saxon, has continually turned away in foolish fear and prudery, hesitating to call things by their proper names and avoiding the main issue at all hazards. If we seek for an explanation of this sad paradox it may be found in certain aspects of modern religious beliefs. In the revolt of the primitive Christian church against the excess and license of Roman civilization; in the separation by the church of things carnal and things spiritual; and in the false and exaggerated conceptions of chastity developed during the monastic period are to be found the sources of the modern world's degradation of sex which has supplanted the pagan glorification and worship of the reproductive function. Under the influence of Christian teachings the body and all of its functions, particularly the sexual, have been divorced from the spiritual side of man's nature and debased as agents hindering his salvation. Mediæval medicine still further complicated matters by fostering the belief that continence was incompatible with health, and the two conflicting principles thus engrafted on our civilization are chiefly responsible for the present-day attitude of compromise and hypocrisy toward sexual matters.

As a result of this attitude society is being brought face to face with such conditions that it must in self-protection

recognize and change them, if it escape self-destruction. Modern medicine has been the first to herald a new era—that of plain speech and frank education in sex matters. It has shown the frightful prevalence of the diseases arising from sexual promiscuity; the pathologic and bacteriologic laboratories of the present generation have demonstrated the fact that the most common of these diseases, gonorrhœa, formerly regarded as of slight consequence, is in reality one of the most serious afflictions of the race, since in a very large proportion of cases the individuals infected with it become germ-carriers for years, often without visible consequences to themselves, but passing the infective organisms on to innocent wives in whom the most serious consequences may be produced. The relationship of this infection to pelvic disease in woman and the great frequency with which it causes chronic invalidism, sterility, or conditions requiring serious operations are matters of relatively recent medical acquisition, but are now preached with full authority to laymen.

The protean manifestations of syphilis have likewise been recognized, and the venereal origin of many organic affections of the brain, heart, liver, kidneys, blood-vessels, and spinal cord is now accepted without any doubt. The researches of each year only serve to increase and extend our knowledge of these diseases and to increase our appreciation of the frightful havoc in human life and happiness that results from the modern conceptions of sex relationship and the ignorance of the great mass of laymen in matters of sexual physiology and hygiene. Medical opinion has also been greatly changed in regard to the significance of certain sexual phenomena and in the relation of health and sexual continence.

The exaggerated views of the evils of self-abuse formerly held by the medical profession as a whole are giving place to a saner consideration of the effects of this habit.

Just as soon as medicine could show that the infectious diseases are unnecessary and preventable it became inevitable that a campaign of prevention should be initiated by its leaders. We are now in the midst of a new era—one of crusades against disease. In the educational campaign against tuberculosis, typhoid fever, malaria, hook-worm disease, and other infectious diseases, medicine must include also the most important of all of these—the venereal diseases—and a crusade of prevention must likewise be instituted against them. Medicine has so spoken, and at its word society is being aroused to a new consciousness. Social workers are showing the tremendous waste of female life needed to keep up the institution of prostitution—a necessary evil, according to our mediæval ideas of sex matters. Studies of city and country life are showing how wide-spread is the social evil and its physical consequences. Economists and statesmen are concerned over the increase in divorces and the disintegration of family units; and the dangers of race suicide are becoming subjects of every-day conversation. Legislators are appalled at the increasing financial demands made by the insane asylums and other institutions the very existence of which is chiefly dependent upon the results of vice and venereal disease. The educational campaign spreads farther through the influence of editors, preachers, and educators who have grasped the truth of the situation.

The more intelligent minds of the race having achieved the knowledge of the paradox and its disastrous influence upon society, its filtration to the masses becomes only a

question of time. In this case the ground has been well prepared by the sad experiences of thousands of individuals, who with bitterness lay the responsibility for their moral and physical undoing to the failure of parents and teachers to give them proper education in sex matters. Just as in the case of the modern movement for temperance, so in this movement for sex instruction does the cool reasoning of the average citizen, based either upon his own experience or upon the observation of others, constitute the force that within a few years has brought about a great movement throughout this country for plain truth in matters of sex education. Initiated by the medical profession, the campaign for education in the ethics and hygiene of sex has been taken up by educators in the universities and colleges, by editors, social workers, and, finally, by the church.

Last of all to take part in the movement have been the educators in the primary and secondary schools. These teachers, like the average parent, remain afraid to touch the subject, or are blind to the actual conditions about them, denying the facts, opposing discussion or disclosure, casting accusations of exaggerations or pruriency upon those who do brave public opinion by recognition of conditions, or advocating the old policy of silence and prudery. Other teachers see the facts and are greatly troubled over them, but feel helpless; lacking knowledge themselves, they confess their inadequacy to meet the situation. Only here and there do we find exceptions, in the case of younger teachers, mostly recent university graduates, who carry to the schools the knowledge concerning these matters they have obtained from university lectures. These men feel themselves handicapped by lack of knowledge sufficient to present the subject in an

authoritative manner; but they have served to extend the campaign, and for the chief part they find a ready co-operation of parents in their attempts at guiding the high school student into an ethical and hygienic path sexually.

There can be no doubt that the psychologic moment has arrived when the primary and secondary schools must take up into the curriculum earnest and definite methods of teaching the ethics and hygiene of sex. It is discouraging that the great mass of teachers has been so slow to awaken to a knowledge of the need for this kind of teaching; but the reason need not be sought far in the difficult nature of the problem of just what should be taught, how much, and when, and by whom. No greater, certainly no more vital problem, presents itself to-day for the thoughtful consideration of our educators—and certainly no more difficult one. Just when we should begin to present sex matters to the attention of the child, in how dilute or complete a form should this knowledge be given, how to achieve such teaching without arousing morbid fears and giving birth to psychoses, or without prematurely stimulating sexual instincts, how much of this sex knowledge should be taught at home, how much left to the teacher, and the part the physician should play in this sex pedagogy, are but the chief features of the greatest and most important pedagogical problem of the day. Indeed, we must realize that the field of sex pedagogy is practically undeveloped, and that no part of it has been worked out in any satisfactory way. The whole matter will have to be attacked experimentally and our pedagogic judgments must be based upon the actual results of practice. No other subject admits less of theorizing than this one; and no dog-

matic statements can be made as to the best way in which to proceed. To Germany we may look for some help, for German conscience has been aroused earlier than ours, and for some years an agitation for sex pedagogy has been developing there upon a foundation both ethical and scientific. But while the difficulty of the problem may argue for caution it must not be taken as an argument for too great prudence. Better to attack the situation, even if we do it imperfectly. On one point the opinion of experts upon this subject is unanimous—*something must be done*; and society in a vague unrest and dissatisfaction over existing conditions is expecting help from the schools. Parents have acknowledged their weakness and their inability; and although theoretically we may believe that sex teaching should be done by the parents and in the home, we also know that a moral and intellectual regeneration of the present generation of American parents would have to be accomplished first, before such teaching is possible. Such a parental regeneration is beyond the range of possibility, hence the schools must take up the burden of fighting sex ignorance just as thoroughly as they have been occupied with the fight against illiteracy.

Within the last five years societies advocating the teaching of sex matters to school-children have been formed in seventeen States, and actual instruction of this kind is now being given in some schools in New York, Maryland, Michigan, Oregon, and Washington. Scattered attempts elsewhere have been made; but all of these efforts have been almost wholly the work of medical men and have been concerned chiefly with the spreading of the knowledge of the dangers of the venereal diseases. The medical interest in this crusade has been

chiefly one of disease prevention and has appealed to the element of fear. For this reason the campaign against venereal diseases has been criticised by some educators as an attempt to frighten young men into virtue. But it is accomplishing what religious and moral instruction up to the present time has not succeeded in doing, by arousing a popular movement for sexual purity on the grounds of physical welfare. More than this is needed, however; there must be developed a higher ideal of sexual relationship in its broadest meaning. Our young people must be taught not only the physical evils of sexual misuse or abuse, but the significance and value of normal sex relationships must be interpreted for them in no uncertain terms. The best as well as the worst aspects must be shown, the physiologic as well as the pathologic.

Methods of Attacking the Problem.—Within the limits of so short a chapter but little more can be done than to sketch very briefly the main points to be considered in sex pedagogy in the high school. As my own experience in such teaching has been almost wholly confined to university or college men my views upon this matter have been very slowly taking form through the knowledge of the secondary schools gained from talks with university students coming from the high school and with high school teachers. Fifteen years of experience in lecturing to college men upon sexual ethics and hygiene has convinced me that the great majority of young men who commit sexual errors do so while in the high school, and that for such the lectures in the university come too late. In talking with university students I find that they insist upon the need for such instruction in the lower schools, and an often heard comment is an expressed wish that such instruction had been given in the high school

at home. It is, of course, true that a certain number of men who enter the colleges still clean lose themselves while students, usually as the result of drinking habits acquired during the college course or the influence of evil-minded companions who have had a perverted conception of sex matters ever since their days in the secondary schools. All experience, physiologic and pathologic, as well as sociologic and pedagogic, points emphatically to the age of puberty as the time when the youth of both sexes must be so instructed in sex matters that they will have a perfectly healthy understanding of the subject and develop naturally in the way of health and virtue and escape vice and disease.

For the boy, at least, the period of puberty usually is coincident with the years spent in the high school; and it is under the influence of the latter that the most important crisis of his physical life is passed. Few teachers realize the significance of this change of life in the boy—about it centres the whole boy-problem. The emotional and nervous strain, the physical weakness, with the mental unrest and lack of a sense of proportion that characterize this age are rarely interpreted by the teacher as sex phenomena, and still more rarely met by sympathy and tact on his part. Nearly all of the failures of boys in the high school or at home during this period can be traced to this cause; and teachers and parents are the ones to be blamed rather than the unfortunate boy.

What Shall Be Taught.—While all must agree upon the necessity of some instruction upon sex matters to the boy at the age of puberty, the point which here chiefly concerns us is the nature and amount of such teaching. Sex instruction, I believe, should be of two kinds; it must be *constructive*, as well as *negative* and *preventive*.

Not only must the moral and physical evils of vice be shown, but the ideal side and the higher significance of the sex relationship must be given equal emphasis, or the dangers of a one-sided teaching will ensue. It is just as important in this day to teach the need, the beauty, and dignity of the normal sex relationship as it is to preach the horrors of sexual vice and the venereal diseases. We may then outline a programme for sex pedagogy in the high school, as follows:

A.—CONSTRUCTIVE TEACHING

1. The essential anatomic and physiologic facts concerning the organs and function of reproduction should be taught to boys and girls in separate classes by properly qualified men and women teachers, respectively.

2. Courses in botany and zoology may be given in mixed classes and the phenomena of reproduction treated simply and naturally, without evasion or prudery. Tact and common-sense on the part of the teacher should be employed in revealing rather than in concealing.

3. Sex and the reproduction of life should be treated not as vile or evil matters, but should be taught as the greatest and most wonderful phenomena of life. Ideals of home life, biologic and sociologic, the significance of the family, the mutual obligation of the sexes, and the necessity for social conventions should all be taught as a part of the preparation of the youth for good citizenship. History and literature should be freely used to build up high ideals of sex relationships. The ideals of ultimate happy marriage and parenthood should be held up, and the necessity of complete preparation, both physically and mentally, for this should be carefully instilled into the developing minds and characters of high school students.

4. The physiologic significance of night dreams and emissions must be taught in a sane way to the boy. He must be shown that these are normal, that they do not indicate any disease or weakness, but are, on the contrary, a sign of his developing virility. He must be taught also that there is a certain periodicity in his sexual life, and that many sensations and emotions are normal and must be regarded in a natural way, without worry or undue consideration. That the number of nightly emissions varies greatly in a given time in the case of perfectly normal and healthy men, and that frequency in itself is no indication of what is normal or abnormal must be clearly shown him. The standard of physical well-being, energy, and the desire to be something and to do something are to be given him as criteria of the normal course of his sexual functions. The importance of exercise, bathing, good and sufficient food, fresh air and sufficient sleep, abstinence from narcotics and other drugs, and conservation of his developing sexual powers by refraining from masturbation or intercourse are all-important points in the personal hygiene that should constitute a position of primary importance in the high school curriculum.

A similar line of teaching adapted to sex differences should be given the girls by teachers of their own sex in segregated classes. Here the significance of the menstrual function should be carefully taught in such a way that the too-prevalent ideas of humiliation and physical inferiority be counteracted by the development of an entirely different psychical atmosphere about the whole matter. The sacredness of the function, and a healthy attitude toward maternity and the marriage relation should be instilled in a natural way into the minds of the

young girls without awakening precocity and over-sexual-consciousness. This teaching should be impersonal, without much dwelling upon the sexual organs or the sexual act, and treated always in a biologic way, without over-sentiment or morbidity.

5. The vice of self-abuse should likewise be treated in a sane way, according to the views of the best modern experts upon this question. It can be truthfully said that more harm has been done by warnings against self-abuse than was ever caused directly by the habit itself. It should be treated of as an abnormal, unmanly, unsatisfactory, and unpleasant habit, that grows by use and uses up energy and vitality needed for other purposes. It can be shown that a boy in whom the habit has become a thing of daily occurrence is not likely to be energetic, cheerful, vigorous, and pushing in his studies and in other interests, but is likely to be jaded, dull, and lacking in interest in life. The moral injury of yielding to any habit should be applied here, and the importance of self-control in general should be emphasized directly and indirectly. Similar teaching must be given to girls by teachers of their own sex.

6. The old error that chastity is incompatible with health must be replaced by the modern view that sexual indulgence is not a physiologic necessity. Boys should be taught that many men of the strongest physical and intellectual development have lived perfectly healthy lives with complete abstinence in sexual matters. Celibacy should not be taught, however, and the highest ideal of life presented to high school pupils should include the ideal sex relationship as exemplified in the duties of fatherhood and motherhood. The importance of reproduction for the race must be taught as the highest ethical

responsibility laid upon the individual man and woman. Such a responsibility entails now a certain degree of preparation; certain years for education and physical development, and for the establishment of the life work, business, or profession are needed, and during these years from the age of puberty up to the age of twenty-six or more, self-control is necessary, and chaste living not only desirable, but necessary for the good of the individual and the race. As matters stand now, young people in great numbers acquire the idea that sexual looseness is a part of life, and that every one is expected to have had some experiences of this kind. It is all explained by "human nature," and that is said to be "unchanging." Just such sophistries as these must be counteracted in the schools, particularly in the high schools. Nothing is more sad than the cynicism of the young man who is suffering from the results of his philosophy of life, in the acquisition of venereal disease. The expressed belief that "all men do it" reveals the home and school training, as well as the narrow experience of such young people. They have not learned that there are men at the other end of the human scale who do lead clean lives, and just as manly, vigorous, and useful lives, as those who, under the fatuous self-deception of vicious experience claim to know real life and the real world. The writers and philosophers who have preached the doctrines of "living one's own life," of "the necessity of knowing all experience," the "sowing of wild oats," and the necessity for every young man's having his "fling" have a terrible responsibility upon them in the shape of young lives come to wreck through the practical application of such theories. The day is past when any one can hold such views in the light of the revealments of modern medicine

regarding the results of the perversion and misuse of the sexual function. When the harvest of wild oats consists chiefly of diseases affecting not only the individual directly concerned, but manifesting themselves also in innocent wives and children, upon more remote descendants and upon the race as a whole, then no one having such knowledge can tolerate for a moment this specious, vicious argument. And it is just against this very thing that a large part of the constructive sex education in the schools must be directed.

7. Such teaching must be to large extent positive. It must be given by teachers who can hold the respect and confidence of the young people under their charge, and who can stimulate the growth of ideals. Everything that makes for character development and for the strengthening of self-control is of the very greatest importance in establishing high ideals of the sex relationship, and hence in the prevention of sexual mistakes and perversions. Prophylaxis may thus be indirectly obtained without too much isolation or over emphasis of the sex passion itself. With children in whom the germs of sympathy and altruism have been awakened, the development of a high ideal of sex relations from the positive side will not be difficult. The broader relations of the sexes in their influence upon human progress and the development of human ideals, as well as the rewards of a normal sexual life in the fulfilment of family life can be presented to the high school student properly; and certainly are of greater importance at this time than the teaching of civics, since the family-unit constitutes the foundation of the State, and the preparation for the broader knowledge should come first.

8. The foundations for such positive teaching of sex relations must be laid farther back than the high school.

The child should not be allowed to come unprepared to the strain and stress of puberty. Hence it is essential that sex pedagogy be begun before this time, whether in the home or in the school. If not in the home, then it becomes the function of the primary schools. It is not within our province here to discuss the material or the methods of such primary sex pedagogy; but we may venture the belief that it should be general rather than detailed, and chiefly constructive. As we are concerned with the character of the teaching during the period of puberty, the methods of teaching the material outlined above constitute the most important pedagogical problem now facing us. As stated above, no detailed methods have been worked out, the whole matter is in an experimental stage, properly trained teachers are lacking, and even satisfactory literature is not obtainable in any form that can be utilized. It is necessary, therefore, to proceed with caution in constructive sex pedagogy, carefully feeling the way, avoiding the pitfall of sentimentality on the one hand and that of sexual stimulation on the other. The very newness of the experiment, and the danger of producing an unfavorable reaction in the minds of the public are good reasons for the exercise of great care in the beginning of such teaching. But the public is waiting for such teaching and will give its hearty approval of attempts made in the proper way.

B.—PREVENTIVE TEACHING

1. The attack upon the problem from the stand-point of preventive medicine has been developed to a much greater degree. Indeed, from the medical side, the attempts at sex pedagogy have been chiefly along this line; and the physical evils of sexual misuse or perversion, as

manifested in the venereal diseases, constitute at the present time the chief material of sex pedagogy. This emphasis on consequence has, curiously enough, been criticised by certain educators who see the whole question from laymen's eyes and not with medical understanding. A good deal of sentimental twiddle-twaddle has been uttered about the teaching of "venereal pathology," about the appeal to the "fear of consequences," the "frightening of youth into virtue," the "shocking of tender susceptibilities," etc. These same educators hark back to the old appeal that virtue should be taught rather than the results of vice; but centuries of this appeal on the part of religion have failed utterly and the venereal evil to-day is more appalling than it has ever been at any period in the history of civilization. The appeal to virtue for virtue's sake alone has not been successful hitherto, because such virtue has not been shown to have any *positive* value. It has remained for medicine and sociology to show that the spiritual conception of sexual virtue has a positive foundation of the most tremendous importance to the individual and the race; and this foundation is one of *consequences*, just as it is of every other positive virtue. It is not necessary to pursue this argument farther; in its modern attitude toward the universe the human mind demands, first of all, that it be shown the reason. In the case of this great fundamental human instinct and passion any attempt to restrict what have previously been accepted as rights and privileges must be clearly shown to be based upon very good and sufficient reasons. It is not a question of *fear* in a cowardly sense, as some sentimentalists would have it regarded, but one of *common-sense recognition of cause and effect*, precisely the same attitude that we should have

toward small-pox, typhoid fever, and tuberculosis, only more marked because of the more serious and farther-reaching consequences.

2. I believe emphatically that the physical evils of venereal promiscuity should be fully taught to the young people of both sexes at the age of puberty. This teaching cannot be done with full authority by laymen, but should be given by properly qualified and reputable physicians of both sexes who have special preparation for such work. That few teachers of this kind exist at the present time is true; and it will become necessary to develop such. When they are not available, then this teaching should be given into the hands of the best prepared laymen available, most naturally into the hands of the teachers of biology. Indeed, there is no reason why teachers of biology should not have included in their preparatory work a medical course fitting them for such teaching. Approved leaflets and books may help greatly in such teaching, and there is great need for good literature of this kind. Special teachers may also be employed by the State, district, or county to go from school to school delivering courses of instruction. If nothing else can be secured the State university medical school could supply lecturers on a university extension basis. Such lectures could well cover the entire field of preventive medicine.

3. The material for these lectures should consist of a full exposition, in simple language adapted to the age of the children, of venereal pathology, particularly of the two diseases gonorrhœa and syphilis. The general nature of these diseases, the relative incurability or difficulty of cure, the consequences remaining even when a "cure" has been effected, the development of "germ-

carriers," the danger of apparent cures, the local and remote effects of these infections, the frequent cause of blindness in the infant, the production of sterility in both sexes, pelvic disease in the female with consequences of severe or fatal operations or chronic invalidism, the relation of syphilis to organic lesions of the internal organs, insanity and other nervous affections, the transmission of the disease to the progeny—all this, and more, should be put before the young boy who is reaching the period of sexual temptation. Prostitution, in its full significance, as requiring the sacrifice of the lives of the women entering it—the full sociologic meaning of white slavery and the part played in this frightful tragedy by every male who indulges in promiscuous intercourse—as constituting the source of all venereal disease, and as the fountain-head of infections involving the innocent as well as the guilty, should be explained to young people at the age of puberty. The dangers of using common objects should be taught in connection with these diseases, as well as in the case of tuberculosis and other infections.

4. In addition to the peril of venereal disease should be taught the degenerative effects of unrestrained lust, both in masturbation and sexual intercourse. The sapping of energy, the weakening of the will power and the physical and mental deterioration resulting from premature or excessive use of the function should be shown without exaggeration or overdrawn pictures of the evil results of masturbation. The latter should not be made a greater evil than promiscuous sexual intercourse, as it has been and still is by ignorant parents and teachers. Full warning against the quacks who fatten upon the sexual ignorance of young boys and men should be given; and young people should be advised to go to their

family physician if they believe they have any organic condition or defect. The bugbear of varicocele should be laid by anatomic explanation.

If such information be regarded as strong meat for young people the situation justifies it. If it be properly given no normal young person can be other than helped by it—if the neurotic ones occasionally develop phobias and psychoses it may be taken for granted that they will any way, from other causes, particularly the very evils we are attacking; and phobias against these evils are less harmful to society at large than the conditions arising from the evils themselves.

5. In the high schools other problems offer themselves bearing more or less directly upon the questions here concerned. The part which the high school secret fraternity plays in the acquisition of venereal disease by high school students is in my experience a very important one. I have known of one of these societies in which every young boy was found to have venereal disease. Interscholastic athletics and the uncontrolled visits of young boys to strange towns or cities lead inevitably, under our present conditions, to alcoholic and sexual indulgence on the part of a certain number of boys. Greater control and a closer supervision of these factors is urgently demanded. The social features of the high school, and all the social and co-operative activities should be so guided that they will be potent in bringing about an ideal of the higher significance of the sex relationships.

Conclusion.—In a very brief space, and very inadequately, I have endeavored to outline the problem and the chief means of attack. Since the latter is the burning question, the attempt at solving this great educational problem may be summed up as follows:

1. The development in young people of an ideal conception of sex relationship, and the necessity of sex partnership in all that stands for life—spiritual and physical, evolution and procreation—should form the foundation of sex pedagogy.

2. Upon this foundation should be placed the fullest teachings of the sociologic and hygienic aspects of the problem, particularly all that is concerned with the prevention of disease and the conservation of human life, health, and happiness.

CHAPTER XXI

AGRICULTURE

C. H. ROBISON, PH.D.

STATE NORMAL SCHOOL, UPPER MONTCLAIR, N. J.

As a subject in the high school curriculum, agriculture is of recent date. During the first half of the last century we find scattered instances of futile attempts to introduce it into certain academies with humanistic tendencies. For years the agriculture taught in many land-grant colleges was of purely secondary grade. Unlike many other secondary studies, it came down from the college only indirectly; that is, it was made effective in the high schools after a partial failure in the elementary schools with their severe handicap of the unprepared condition of the teachers. When scarcely one hundred publicly supported secondary schools had introduced agriculture, it was required by law in the rural schools of twelve States. While rather indifferently obeyed, these laws indicated a growing sentiment that has resulted in the rapid introduction of agriculture into rural high schools.

What Agriculture Is.—To those living by it, agriculture is a business; to those practicing it successfully, it certainly is an art. As a school subject it might be called a study as safely as most branches; whether a science or something else depends on the kind and amount of organization. If the facts of agricultural practice are considered

with reference to underlying principles, and if from these are formulated definite lines of procedure organized into a system, we may call the product a science. For secondary school purposes, it might even be sufficient to present merely the illustrative materials verifying these principles. The science of agriculture is more than a unifying organization of correct agricultural practices. It includes an exposition of the correctness of those practices in the light of underlying principles drawn from physics, chemistry, and biology, just as the last, in its turn, makes large use of the other two.

Agriculture and biology, when handicapped by lack of a broad foundation, must be presented largely from the nature-study view-point, in which the recurrence of the seasons governs, to no small degree, the selection of topics and their subsequent organization. Agriculture may then be designated rather as an introduction to science than as a science itself. This view will be elaborated later.

Aims.—Like any other art, that of farming requires much practice. Many details may be repeated in close succession. The final results of many of the operations, however, cannot be judged until all opportunity for correcting bad practices has passed. The experience gained must be applied to the problems of another growing season. Quite evidently, then, it is outside the province of the general high school to give any but the most meagre training in the art of farming. In short, it cannot be expected to function as a trade school. This is entirely aside from the proposition to create a congeries of trade schools associated with the non-special high school, on the same campus and under the same administration. Indeed, many self-styled agricultural schools, of both

secondary and higher rank, give no instruction, and often no practice, in many common and fundamental farm operations. They frankly state that a boy not reared on a farm cannot profitably pursue most of their work. Until special secondary schools of agriculture do this easily, the general high school should not be expected to do so. In spite of many contrary opinions, it might seem as reasonable, however, for the general school to turn out gardeners as stenographers. The "multiple high school," if we may coin the term, might properly do both.

While not giving much practice in the agricultural arts, the study in the general high school may reasonably hope to give the student an understanding of the simpler processes and laws of nature involved in raising crops and animals. It may bring him to realize that a trained mind is necessary to the successful management of a farm. It certainly should furnish him with a working vocabulary with which to read intelligently agricultural journals and official bulletins. The materials used will have great informational value whether the aim be consciously utilitarian or not.

If we accept the view that to be cultural is to be useless, we can hardly imagine agriculture having a cultural value. To the extent that it makes the otherwise dead science bristle with reality, gives an intelligent view of the foundation of our national prosperity, creates a thoughtful attitude toward the future calling of the students, to that extent all must admit the study to be cultural in the highest degree. The study of agricultural economics in most elementary fashion may suggest a better sense of proportion between capital and labor, employer and employed, work and leisure.

The migration from farm to factory is probably too

deeply rooted in social and economic conditions to be affected by efforts of the schools as much as we might hope.

Disciplinary Values.—The same disciplinary values may be claimed for agriculture as for any other high school study using the materials of science with the same degree of organization, when taught by teachers as competent as those in charge of the standard sciences. This is entirely aside from the cloud under which rests the whole theory of formal discipline. For if there is virtue in observation, in individual laboratory work, in keeping careful and neat records, in the motor activities involved, agriculture offers the same possibilities as any science, although they have not been utilized to anything like their full extent. It affords as much use as they do for induction and verification. In short, it should be as useful, if properly taught, as any subject in the curriculum for giving training in the scientific method. But learning to garden by imitation or by rule certainly will not accomplish this desirable result. Reasoning ability not due to heredity results largely from repeatedly forming and correcting judgments. Casual examination of the materials of high school agriculture show that they offer abundant opportunities for doing this. The problem is chiefly one of efficient instruction.

The introduction of agriculture is an effort to relate school work more directly to the interests of rural communities, which usually show greater homogeneity, both racial and vocational, than those supporting city high schools. The presence of one interest overshadowing all others is an advantage, but the great complexity of this one is something of a disadvantage in arranging a curriculum.

Agriculture finds its justification in the doctrine of interest in a way unequalled by most studies. This is true whether it be the means merely of "humanizing" the standard sciences, whether it be pursued in a superficial way, or whether studied in detail. Even in the latter event, we can hardly expect this one subject to be purely vocational while the general spirit of the high school is so decidedly the reverse.

Relation to Grade Work.—The pupils in about one-half of the high schools with courses in agriculture have had some nature-study or elementary agriculture in the grades. Just in so far as the nature-study idea, that of observational study of common natural objects of interest, is preserved, to that degree will the work of the grade be of direct benefit to high school courses in agriculture. It will keep alive the spirit of inquiry, create a respect for the pupils' own observations, and bring together some of the raw materials for later generalizations in the high school studies using the more strictly "scientific" method of thought. To the degree, however, that the seventh or eighth grade attempts to make a survey of the entire field, to become informational rather than observational, it will be likely to overlap or encroach on the province and materials of the first-year high school study, so that the latter runs the risk of seeming insipid. When preceded by suitable work in the grades, an elementary course in the high school has a peculiar field discussed later. The more technical or specialized divisions of a three or four year course in agriculture may profitably use a review of earlier observations to serve as an approach to the subjects of serious investigation.

Present Status.—The number of public high schools, both general and special, has increased from seventy-five

or eighty in the school year 1906-1907 to approximately one thousand in 1909-1910. While the annual rate of increase has fallen from 300 per cent to less than 100 per cent, it is still so large that figures given here will be out of date before reaching the public. Considerably more schools have agriculture for part of a year, a third or a half, than have it extending throughout the year. Even in this case, a "full" year's work is as likely to mean thirty-two or thirty-four weeks as it is to mean thirty-six, thirty-eight, or forty weeks. These estimates are based on reports from one hundred and seventy-one schools with courses one year or less in length. Of the entire number, eighty-two reported an eighteen-week term. In 1910-11, nearly seventy-five schools received State aid for agriculture, about half of them offering general high school work as well, and half being more properly classed as special or agricultural trade schools supported entirely by the State. Although the number of technical schools had not increased materially by 1912, the State-aided high schools with agricultural departments numbered about one hundred and fifty, while another hundred maintained agricultural courses of two or more years without State assistance. Correspondingly recent data as to the number of high schools offering courses of one year or less are not available as this chapter goes to press.

Among the States making provision (1910) for agricultural education, apart from agricultural colleges and industrial schools for negroes, may be mentioned Alabama, Arkansas, California, Georgia, Idaho, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Nebraska, New Jersey, New York, Oklahoma, Pennsylvania, Texas, Virginia, and Wisconsin. Owing

to the indefinite and varying use of the term "agricultural high school," both legally and in popular usage, it is impossible in a mere list to differentiate the two classes mentioned above. No high school in New Jersey, and, perhaps, in other States, has taken advantage of this financial inducement.

Many other high schools maintain pretentious industrial departments without special State aid. In the States having the largest number of high schools with agriculture in but one year, namely, in Missouri, Nebraska, and Ohio, the work is supported only by local funds.

An effort has been made in the last three sessions of Congress to lend Federal aid in establishing agricultural high schools, extending the present policy regarding the colleges. In its latest form the so-called "Davis Bill" proposes to extend this aid under certain conditions to State normal schools and to general high schools for the maintenance of departments of agriculture, mechanic arts, and home economics.

While as high as six hundred minutes per week have been reported for a single class in agriculture, five periods of forty minutes each is the amount of time spent by the classes in over half of the schools. While this indicates that little extra time is regularly appointed for laboratory or garden exercises, it should be borne in mind that the same schools give little, if any, such extra time to other sciences.

College Entrance.—Agriculture is probably as well taught in the smaller high schools as are the sciences generally—also as badly. Any science teacher whose work is acceptable to colleges using the accrediting system will probably teach agriculture to their satisfaction,

though often not to the satisfaction of the community. Where very few universities and colleges were willing to accept agriculture as late as 1908, we find two years later that between sixty and seventy have arranged to give entrance credit for the subject or are willing to do so if it is offered. In some State universities it is accepted only by the colleges of agriculture and of education, while in others it is accepted by the college of arts and sciences as well. At present the attitude of the colleges is more liberal than the quality of instruction in agriculture in a large proportion of the schools would seem to justify. There is scarcely any disposition to accept it for more than a half-unit or one unit of credit. To quote from the report of the Committee on Encouraging College Credit in High School Agriculture:¹

"In a condensed form, the following definition of a unit and of a half-unit seems to be acceptable to most institutions:

"One-half Unit.—One-half year given to the study of soils and plants and their relation to each other. There shall be sufficient experimental work to accompany the subjects discussed.

"One Unit.—One full year shall be given to the study of soils, plants, insects, and farm animals. There shall be sufficient experimental and demonstration work to be equivalent to one full year of laboratory work."

Using the above as a working definition of a unit and of a half-unit, a high school may not reasonably expect any credit for a course of eighteen weeks of only two hundred minutes a week. A year of this amount of work each week would hardly be more than the equivalent of a half-unit, and would, if including all the full-

¹ National Education Association, "Proceedings and Addresses," 1910.

unit topics, be open to the objection of having the time scattered over too many topics. Certain universities, notably the University of Wisconsin, permit a combination of agriculture with botany to be offered as one unit.

None of the ninety-four college officials replying to the inquiries sent out by the committee questioned the informational or disciplinary value of the study.

One-Year Agriculture.—In view of the foregoing facts, we may well inquire into the proper function of a short course in agriculture taught in the first or second year. It cannot compete with or build upon the physical sciences as at present taught. It will probably parallel or follow botany and physical geography. While at present agriculture exists too much apart from either study, widely different suggestions have been made as to its relations to them: one pointing to close correlation, the other to the substitution of a year's work in agriculture for the half year's work each in botany and physical geography so commonly given in the earlier years of the rural high school. For high school agriculture texts already give extensive treatment of topics belonging to these studies.

Any science given in the first year naturally functions somewhat as an "elementary" or "introductory" science, especially if attempting also to supply desirable facts from other underlying sciences. An established science has a thread of continuity so painfully lacking in the various proposed courses in "elementary science." These excel in the selection of topics closely related to human affairs and in including none merely for the sake of symmetry or logical development, though commonly neglecting biological phenomena. The proponents of agriculture claim that the standard sciences as presented

to-day contain too much matter unrelated to actual life, and that no one has enough points of contact with life to serve as an introduction to science at large.

Agriculture promises much as an introduction to the standard sciences and as an orderly vehicle for almost all desirable scientific topics, one that has a very evident relation to an environment not distinctly urban, and one that may seem logical to the adolescent mind. The important point, after all, is not conformity to a scheme that is logical only from the adult point of view. Agriculture possesses a thread of continuity most apparent on the economic side, and its materials are as well organized, to say the least, as are those of the tentative courses in "elementary science." It might better be considered as a practical and humanistic "introduction" to science than as an "elementary science."

The Longer Course.—An agricultural high school, in the opinion of the American Association of Agricultural Colleges and Experiment Stations, should require all students to spend at least one-fourth of the entire time on agriculture (or home economics, for girls) and should make definite provision for practice in farm operations. Many agricultural secondary schools require a much larger proportion of the student's time. A well-developed optional course will approach this standard with the possible exceptions of some general or introductory work in science in the first year and less effort at actual farm operations.

Its Differentiation.—The relative positions of the different divisions of the general course in agriculture is one of the first administrative questions to arise. We have no precedent to guide, and present usage shows scarcely any notable agreement. Even the names of the divisions

show puzzling confusion.¹ For instance, the tendency in practice is to arrange a compact course called "animal husbandry," including all consideration of farm animals, and usually given in the same year, preferably the third. The recommended courses tend somewhat to break this up into a multiplicity of part-unit studies to be given in different years, as judging and breeds of stock, to be taught early in the course, and feeding and breeding of stock, to be studied in the fourth year, with dairying somewhere in between. The study of plants usually occurs in practice during the second year, whether labelled agronomy, crops, horticulture; or else in the first year, when included in that as yet undefined thing, agricultural botany. The proposed courses of study agree mainly in placing this "new" botany in the first year. They also further break up the plant work into forestry, gardening, plant propagation, plant breeding, seed judging, and plant diseases. While any one tentative course may plan these elements to come mostly within some two years of the curriculum, the joint effect of the recommendations is not to furnish any clue to their proper place. In addition to the agreement as to the position of agricultural botany, both sets of courses agree in placing farm management in the fourth year. The theoretical courses place here also the isolated topics, feeding and poultry.

Correlation.—An important factor in placing the agricultural topics is their proximity to the related natural

¹ These remarks are based on a comparison of the curricula of seven widely separated high schools which have longest had in operation agricultural courses of three or four years, and of seven tentative courses, two recommended by State departments of education, three by State university officers, and two by officials of the United States Department of Agriculture.

sciences. A tendency to place soil study in the first year might be ascribed to the usual occurrence of physical geography at that time, or, in the third or fourth year, to the presence of physics or chemistry. Likewise with dairying, whose manufacturing processes are largely chemical. A justification for separating seed and stock judging and breeds, apart from studies involving heredity, chemistry, and physiology, may well be that the former are largely matters of observation rather than matters dependent upon principles learned in the high school sciences.

Correlation is a matter of administration and teaching method. It should enable the present sciences to find a social expression in the agriculture taught. The latter should be close enough in time to be of real value in illustrating scientific principles. Likewise, the agricultural topic should follow so closely after the science as to render unnecessary a review, practically, of the scientific matter. Thus may be justified the splitting up of the agricultural subjects referred to above. Another alternative is the elimination of science, as such. A notable example is furnished by botany. Not a few high schools have substituted a year course in agriculture for botany. The course in agronomy, planned by the Committee of Instruction in Agriculture of the Association of American Agricultural Colleges and Experiment Stations, with a few additions, would include about all the botany a rural high school could profitably teach. Certain recent agricultural texts include much plant physiology and not a little morphology, the botanical topics generally ignored being flowerless plants, except bacteria, and identification by analysis.

Texts.—Until 1906 only one text of high school grade had appeared. Although three others were published

during the next two years, not until 1909 did a text appear written for use in the upper years of the high school. Many texts used by agricultural colleges have been found very usable in extensive secondary courses. The present need seems to be for a three or four book series, with topics and treatment graded for as many years, or for a series of booklets or teaching monographs on the various subdivisions of agriculture. This need is being met, in part, by the reports being issued by the committee just mentioned.

Apparatus.—The equipment problem in agriculture is really little different from that in any science work, for some work in any science can be done with home-found materials, and is entitled to the same consideration as agriculture taught by the same means. In all cases it is largely a matter of ideals, arising from within or imposed from without. Much apparatus already bought may be shared with the agricultural department, notably compound microscopes, Bunsen burners or gasolene torches, balances, ringstands, reagents, and much glass-ware. If work of scientific dignity would be done, some apparatus peculiar to agriculture must be purchased, such as milk-testers and grafting, spraying, and gardening tools. A basement room will be found desirable for much of the work involving dirt and litter. The room provided for biology, chemistry, and physics will suffice for most of the other work if space is at a premium.

Time.—"Lack of time" has almost equalled "lack of equipment" in numerous opinions about obstacles to the introduction and successful teaching of agriculture. However, a community that favors its introduction would doubtless sanction a sacrifice of time by some other study farther removed from the interests of its members. If

agriculture cannot survive in the struggle for time on the school programme it must go down. More valid are the complaints regarding lack of time for field trips requiring more than single recitation periods. Instances can be cited, however, of principals taking an entire afternoon for trips that seemed profitable. Owners have gladly brought stock before the school and implements have been assembled in the building; but methods of farm management, as shown by the standing crops, can only be studied on the ground. Experiment stations conducted by the State close to the school have partly overcome this difficulty as well as that of managing a school demonstration plot. The idea of doing on the part of the pupil is here lacking and must be provided for otherwise.

Lack of time, both in the schedule and on the part of the teacher, may be remedied by a device too little used, that of having students of two successive years join in the same study, which alternates with another study the next year.

Teachers.—One of the chief obstacles is that of the teacher. The one-year course devolves upon the science teacher or the superintendent. The former is often unsympathetic, while the latter often lacks scientific training. The best preparation we can reasonably expect, at present, is a good training in college science, supplemented by summer school courses in agriculture, now offered in nearly every State. For the more pretentious courses an agricultural college training is almost a necessity, and some professional training is highly desirable. The graduate in agriculture, like the graduate in engineering, can command a better salary than school boards have yet been persuaded to pay. The supply has been so nearly absorbed by the demands of national and State

agricultural departments and by the colleges themselves, and now by the many new special schools of agriculture, that general high schools are seldom able to enter the competition. For several years the salaries of agricultural college graduates accepting positions of all kinds have shown a strong central tendency slightly below nine hundred and fifty dollars for the first year out of college. It must also be considered that positions with the government, the college, and with dealers in agricultural supplies, all offer so much more in the way of promotion, travel, tenure, and independence, that the high school must offer stronger inducements than at present until the supply overtakes the demand.

CHAPTER XXII

COMMERCIAL EDUCATION

SELBY A. MORAN, B.L.

TEACHER OF COMMERCIAL SUBJECTS, ANN ARBOR, MICHIGAN

Introductory Statement.—The growth of commercial education in this country during recent years has been phenomenal. Almost before schoolmen realized it, the commercial department became a permanent part of secondary education. How can we account for these new conditions which have come upon us so suddenly? The explanation seems quite simple. It is merely the culmination of a feeling which has been developing for a long time. Schoolmen have been unable to resist the growing opposition on the part of business men who believed that our high schools were not giving the kind of training needed by the large majority of pupils who did not care to go to college. This feeling gradually grew into a determined spirit of antagonism and caused people boldly to demand that the high school train such pupils to do well some specific, practical thing. Something tangible was wanted, something that would fit the boy or girl to render some service that the world needed. If this could be done and at the same time give the pupils a training which would make possible a larger and more comprehensive life, so much the better. The advocates of commercial training seized the opportunity afforded by the situation to press the claim that the business course was the one that would best meet these demands. They

also claimed that commercial studies would appeal more strongly to young people of high school age than the general culture course and thus keep them in school for a longer time. So strong did the demand become that schoolmen gradually yielded, often against their judgment, and introduced business courses. The movement is gradually overcoming every kind of opposition and is receiving the most hearty approval of the public. Already it has won to its support many schoolmen who previously were strongly opposed to it.

The marked success of the course from both the educational and practical stand-points seems to prove the soundness of the position taken. That it has attained such success while passing through the experimental stage and while meeting the most bitter opposition, seems really remarkable and adds strength to the belief that the course possesses in the fullest degree the merit claimed for it. When the business course is more thoroughly developed, when better methods of teaching these branches are devised, and more liberally educated teachers engage in this work, still more satisfactory results may be expected. It will, however, take time to reach the high standard to which the leading advocates of business education aspire.

Aims of Commercial Education.—The ideal high school commercial course has four distinct aims:

First.—To offer a practical training that will induce a larger number of high school pupils to remain in school for a longer period.

Second.—To equip young people as thoroughly as possible to engage in business affairs.

Third.—To make the course broad enough that the student, after completing it, may be able to stand upon

the same plane, intellectually and socially, as those with scientific or classical training.

Fourth.—To have a sufficiently broad course and to teach the subject in such a thorough way that, should the student later elect to take a college course, he will have gained the necessary information and developed sufficient mental strength to do as efficient college work in his special field as students can do in other courses.

A Practical Illustration.—In many of our better high schools these aims are to a large degree being realized. The commercial course in the Ann Arbor, Michigan, High School,¹ for example, aims to produce more than mere stenographers, book-keepers, or office helpers. Its ideal is to train young people to think; to prepare them to take bigger and broader views of the great commercial problems with which later they must deal. Thus trained, they are able, when they enter commercial life as accountants, private secretaries, or in any other capacity, to make the most of the opportunities which come to them. This is possible because they are able to understand and analyze the principles underlying the conduct of commercial affairs and utilize the results to the best advantage. If, instead of going directly into business life, they wish to continue their education in college or university, they have the information and training necessary to enable them to carry on college work successfully. This becomes possible because the work in book-keeping and commercial arithmetic, for example, is handled the same as are courses in mathematics, which in reality they are, though in a more concrete and applied form. The course in commercial correspondence, or business English, as it is

¹ I speak of the course in this particular school because I am thoroughly familiar with it.

frequently called, is treated as a study of applied English; and just as high ideals are aimed at and just as thorough work is done as in courses I, II, III, or IV in the regular English department. The training in commercial geography, which is in large part industrial history, and thus really a study of history, is equal, from both the cultural and disciplinary points of view, to that of any course offered in the regular history department. The work in stenography, which is in fact a language study, though not generally recognized as such, is in many important respects quite as exacting and effective from the standpoint of mental training as the classics or modern languages. I am aware that this claim will be vigorously disputed by most advocates of classical training. I have found, however, that, almost without exception, it is fully indorsed by every thorough student of the classics who has made an equally thorough study of the science of stenography. All the other commercial courses in this school are handled in a similar manner.

Character and Success of Commercial Education.—An equally high grade of work is being done in many of the high schools throughout the country. I believe, therefore, that it can justly be claimed that in our best schools, at least, we are realizing the ideal set by DeGarmo, of Cornell University, who said: "If he has equally efficient teachers and is supplied with equally good facilities, the student of the commercial course is not inferior to his brother in the arts course in the range of his education, in the quality of his discipline, in the dignity of his work or the worthiness of his destination." Such work has, in a large measure, overcome the opposition to business education which formerly was so bitterly waged against it by many of our leading schoolmen. It has

also won to the support of the high school the sympathy of our big, broad-minded business men of the type of John Wanamaker, Andrew Carnegie, and Marshall Field, a sympathy and touch which before business education was introduced was almost entirely lacking. It has come to be almost universally conceded that it is and ever should be the business of our schools not only to keep in the closest possible touch with the world of business, but also to qualify their pupils to successfully perform their part in it. The commercial course has been the one thing needed to supply this heretofore missing link between our schools and the business world.

Business education in the high school proved so successful that there soon arose a demand that our colleges and universities offer advanced courses along commercial lines. As a result, all of our leading schools are offering such courses, some, like Harvard University, offering a splendid graduate course in business. The constantly increasing number of students enrolling for such advanced courses will soon silence the complaint voiced by the late Marshall Field that "The commercial world is starving for high-class material."

Subjects in the Course.—What subjects should be included in a high school commercial course and how much time should be devoted to each is, and always will be, a debatable question. Probably the most carefully prepared material on this feature of commercial education in secondary schools may be found in the report of the Committee of Nine of the National Education Association¹ and the papers discussing it by James J. Sheppard, principal of the New York High School of Commerce; Ber-

¹ "Professional Education in the United States," *Bulletin No. 23*, series K, University of the State of New York, Albany.

trand DeR. Parker, principal of the Rockford, Illinois, High School, and J. Remson Bishop, principal of the Walnut Hills High School, Cincinnati, Ohio.¹

The purely commercial subjects suggested in the report of the Committee of Nine are practically as follows: Commercial law, civil government, political economy, book-keeping, accounting, commercial arithmetic, commercial geography, industrial history, commercial correspondence, penmanship, stenography, and typewriting.

To these, I believe, transportation, advertising, salesmanship, and ethics should be added. The first three are subjects with which every business man must deal, since upon the proper handling of these features of his business, much of his material success will depend. The subject of ethics is one of special importance in the business world of to-day. In this age of immense trusts and corporate greed, it is particularly needful that the schools do their full duty in instilling proper ideals of justice and integrity and in developing in their pupils a due regard for the rights of others.

To the purely business subjects might well be added one or more of the modern languages. Our growing commercial relations with other nations is making more and more important the study of Spanish, German, and French. It is quite possible that Japanese and Chinese may soon become equally important. One danger to be avoided in the selection of subjects other than the purely commercial branches is that too many may be added. I believe that this feature of the report of the Committee of Nine might justly be criticised. Fewer subjects and more time given to each one would produce better results

¹ These papers appear in the *Journal of the National Education Association*, 1904.

and disarm much of the criticism which is frequently, and, I believe, justly, made upon the work done in many high school commercial departments.

Importance of Stenography.—There seems to be a very general misconception on the part of young people, especially young men, as to the value which a thorough knowledge of stenography would be to them. Many high school and university people often fail to appreciate the educational as well as the commercial value of stenography. This is no doubt due to lack of a definite knowledge of the subject. I think it worth while, therefore, to discuss it somewhat at length.

Stenography, viewed from the commercial stand-point, is included in this course for three reasons: (1) It enables young people at the very beginning of their commercial life to earn a better salary than they could hope to secure as mere beginners in any other position. (2) It affords excellent opportunities to acquire, in a rapid and thorough-going way, a definite knowledge of every detail of the business in which one may be engaged, and at the same time enables one to gain a broader vision of the principles underlying business transactions. (3) It offers every possible opportunity for young people to show their understanding of business affairs and to secure promotion to important and responsible positions much sooner than would otherwise be possible.

There are in the commercial world to-day so many illustrious examples of prominent men who owe their successful start in life wholly to the opportunities afforded them in positions as private secretaries, that there seems to be small need to discuss at length this feature of the subject. The following quotation from an address recently delivered by President William H. P. Faunce, of

Brown University, before the graduating class of the University of Michigan, bears directly on this phase of the subject. President Faunce said: "Another calling which few young men are equipped to enter is that of private secretary. Somehow, our ablest young men have thought of stenography as suited only to girls in their teens, and secretarial duties as furnishing small field for ambition. Quite the contrary is the case. The private secretary of Grover Cleveland left his imprint on our country. The private secretaries of William McKinley and Theodore Roosevelt very speedily emerged into public life. The great need of every young man when he gets out of school is to go into training under a master. The private secretary to a strong, resourceful leader of men has the finest training a country can afford, has opportunity for large horizon, mastery of methods, and, later, for an independent career."

Stenography, when properly taught and thoroughly mastered, has even greater value, considered from a purely educational stand-point. To become even a moderately successful stenographer one must have training along several lines, each one of which has large educational value. These are as follows: (1) It compels one to think quickly and accurately. It is of great value to any one to be thoroughly awakened mentally and to have acquired power to think clearly. (2) The scientific study and practice of stenography compels the development of greater ability to hear things accurately. The inability of the average high school and college student to hear all that he should and hear it accurately is really appalling. Stenography, more than any other study, will very largely overcome this almost universal weakness. (3) Mastering the technic of memorizing is an especially

important feature which results from the thorough training of this subject. I do not know of any other subject which affords an equally valuable and specific training. (4) The most important mental training resulting directly from this study is the development of ability to concentrate the whole mind upon the work in hand. If the average high school or university student possessed properly developed ability to concentrate his entire attention upon his studies and do it continuously for as long a period as the average mind is actually able to sustain the effort, he could easily complete the four-year high school course or the four-year university course in three years, or even less time, and not overwork. Professor William A. Hadley recently said: "The teachers of the fourth-year pupils in the Boston High School find that the pupils who have taken stenography have the power of attention and concentration best developed of any who come to them." Since the study of stenography is especially valuable in developing such power, it seems that there should be no question as to the advisability of introducing this subject in every high school, not only as a part of the commercial course, but also as a regular disciplinary study.

Text-Books.—The text-books in use in teaching the commercial branches have, in most cases, kept pace with the progress of the time. In nearly all lines of commercial work the teacher is able to obtain texts that are modern in their methods and based upon recognized pedagogical principles. Unfortunately, this cannot be said of the majority of stenographic text-books now in use. While the texts on this subject are decidedly better than those of fifteen or twenty years ago, there is still large room for improvement. The reason for this is

quite evident. In many cases the writers of stenographic text-books have been men with limited education and no special aptitude for such work. In most instances the authors have been men with large practical experience who have seemed to think that ability to do reporting implied a fitness to write text-books on the subject. This is a combination of qualities which rarely exists, even in a moderate degree, in any individual. The disposition to cater to the popular demand for a short course is another thing that has had a very detrimental effect upon the grade of stenographic text-books being produced to-day. While this has resulted in eliminating much of the lumber which encumbered the older texts, this demand for a course brief enough to enable one to begin earning a salary within a few months after taking up the study has caused many text-book writers to go to the extreme limit. Many of the texts on the subject have been made so brief that the mastery of them cannot possibly produce creditable results. It has apparently caused the majority of stenographic text-book writers and teachers to forget that it takes time to enable the student to do skilled work. Many teachers find it necessary to supplement the brief and inadequate texts they are obliged to use. There is also much confusion resulting from the lack of uniformity in the principles as presented in the different texts on each of the various systems of stenography. This latter feature interferes seriously with the proper development of the pedagogy of the subject.

Office Exhibits and Appliances.—There has been very satisfactory progress in the development of commercial exhibits and mechanical appliances for use in commercial work and available for instruction purposes. Schools may obtain at moderate cost excellent exhibits of raw

material of agricultural and mineral products of this and other countries. Exhibits especially prepared for high school purposes and suitable for such use add greatly to the interest of the student in his work and give him an opportunity to study at first-hand the nature and character of the material with which he will have so much to do in his real life work. In the line of office appliances the commercial teacher is especially fortunate in having available excellent devices of every description. Among these may be mentioned loose-leaf record books in great variety, filing cabinets, adding and listing machines, letter-copying presses, typewriters, duplicators, envelope sealers, stamp-affixing machines, addressing machines, time records, card indexes, numbering machines, change-making machines, check protectors, etc. The only defect deserving of mention in these appliances is in the typewriter. I refer to the unscientific arrangement of the letters upon the key-board; and the lack of entire uniformity of arrangement of the keys on the different machines in common use. It is unfortunate that such an arrangement was originally adopted. The use of the typewriter, however, has become so general that it is practically impossible to make the desired change, no matter how beneficial such a change might be.

Better Preliminary Preparation.—The advocates of commercial education have come to recognize the desirability of as thorough preparation as possible by the student before beginning the work on the commercial branches. Those who have given the matter careful consideration are generally agreed that the later in the high school course the commercial studies are introduced the better. The reasons are: (1) Placing it late in the course acts as an incentive to the student who wishes to

study business subjects to make the required preparation in order to be allowed to enter the commercial department. (2) The student taking this work during his third and fourth years is better able to thoroughly understand the subject-matter and the importance of mastering it as completely as possible. (3) The student is better able to use his knowledge than would be possible if these branches were studied during the earlier part of his high school course.

Obstacles to Be Overcome.—While the progress of commercial education has been exceedingly creditable, still greater development is possible. The obstacles which still stand in the way of greater progress are: (1) The fact that many influential schoolmen still hold the idea that the commercial studies are not truly educational. This objection is rapidly disappearing as people come to realize more fully that the subject studied is not the only test of educational value, but that the manner in which it is taught, the thoroughness with which it is studied, and the interest which the student takes in his work are quite as important factors as the subject itself when considering educational values. (2) The instruction in these branches during the past half-century in the so-called commercial colleges has in the large majority of cases been discreditable, because it has not been of a grade to gain the recognition and respect which these subjects, when properly taught, really deserve. The introduction of business education in high schools, with the better teaching which has resulted and the decided improvement which is being made in the quality of teaching in the better class of private schools, is rapidly overcoming this obstacle. (3) The lack of generally accepted canons as to how the commercial subjects may be taught to the

best advantage is a really serious objection which will require time to overcome. It is certainly a credit to those who have been and are engaged in this work that such splendid results have been produced under such adverse circumstances. (4) The lack of opportunity for the commercial teacher to obtain special training in his line of work. Only a small number of our colleges and normal schools are thus far prepared to offer courses of this kind, and those offered are of necessity largely experimental. Fortunately, all of these obstacles are being overcome and, as a result, commercial education is gaining the respect and influence to which it is entitled.

CHAPTER XXIII

VOCATIONAL TRAINING IN THE HIGH SCHOOL AND ITS RELATION TO MANUAL TRAINING

E. C. WARRINER, A.B.

SUPERINTENDENT OF SCHOOLS, SAGINAW, MICHIGAN

The Demand for Vocational Training.—Vocational training is that sort of training which has for its purpose definite preparation for earning a living. As an aim of the high school, this represents a distinctly new point of view. The aim of education has perhaps always been regarded as preparation for life, but for life in a general sense. Schools have heretofore been regarded as cultural in their aim. To-day many desire the schools to be vocational, to teach trades or callings. In a very broad way, education has always been connected with vocation in that the mental training or discipline gained from study in school is capital for any occupation which one may enter. During the last generation, however, the conception has developed that formal discipline, or the ability to turn a general training of observation, memory, or reason to specific ends, is not so tenable a doctrine as it had formerly been considered. One result of the weakening of this theory in popular esteem has been an insistent demand for courses of study of a specific character, preparatory to definite activities after the period of school life. Society has become impatient of the time required to pursue courses designed for general culture

alone and has demanded what is called a more practical education. It is only within the past decade, however, that this demand has had any appreciable effect upon high school courses of study. Up to the close of the nineteenth century, the avowed purpose of all high school instruction was general in its nature, preparing for life, to be sure, but for life in a broad sense, not specifically for earning a livelihood. But during the first ten years of the twentieth century there has been a marked tendency to offer vocational courses in high schools.

The Commercial Course.—A good illustration of vocational training in the high school is the commercial course. This was the first concession made by high schools to the cry of the public for the practical in education. The commercial course as at first introduced included commercial arithmetic, book-keeping, English, algebra, and history. In order to appeal to a class of students who could not be expected to remain in the high school for the regular four-years' period, either from financial or other reasons, the commercial course was made a two-year or a three-year course and some high schools graduated students with diplomas at the end of these short courses. The first effect of these shorter courses, paralleling part way the full four-years' course, was to cheapen the commercial course in the eyes of the educational world, and consequently to lower high school standards of scholarship. To-day, commercial courses in our larger high schools are four years in length and they include, in addition to the studies named above, commercial geography, commercial history, political economy, commercial law, business practice, stenography, and type-writing. The aim of these courses is distinctly vocational and their graduates are able to step immediately from the

school into offices and counting-rooms. Another definite vocational high school course is that which aims to prepare school-teachers. In some cities the high school offers a course of psychology for teachers to aid in preparing those students who wish to become teachers in these school systems. The State of Nebraska has an arrangement by which a certain number of high schools which offer a course in teacher training may receive State aid to an amount of three hundred and fifty dollars a year. Agricultural courses offer a third illustration of vocational training in the high school.

Present-Day Tendencies.—Present-day tendencies toward vocational training in our high schools, however, centre about those occupations which have to do with the mechanic arts for boys and home-making activities for girls. This condition is a direct outgrowth of the manual training movement which has swept over the United States during the past generation. Among the educational exhibits at the Centennial Exposition at Philadelphia, in 1876, was a showing of the work of the Moscow Technical School. This exhibit attracted much attention and made a deep impression upon the American educational public. At that time, nothing in the nature of hand training existed in the secondary schools of this country; but, inspired by this Russian exhibit and moved by the need of this sort of training for those who were to develop the resources of our land, manual training high schools made their appearance. The first manual training high school in the United States was established in connection with Washington University, St. Louis, Missouri, in 1880. The Chicago Manual Training School was established in 1884 by the Commercial Club of Chicago to prepare young men for technological colleges as

well as for entrance upon mechanical pursuits. This school had a marked influence on the history of manual training and was finally, in 1897, incorporated in the University of Chicago.

The essential features of these early manual training schools were shop equipments for work in both wood and iron. The wood-working shops were fitted out for cabinet-making and joinery, while the equipment for iron-work included a forge shop and a machine shop with the typical machine tools. The early courses of study required the making, for the most part, of various exercises, or models, as they were called, designed to teach the use of the different wood and iron working tools. Planing and boring exercises and the different kinds of joints were made in the wood shops, with drawing out, upsetting, and welding in the forge, and lathe exercises in the machine shop. The primary aim in these courses was general, not specific; cultural, not vocational. It was, to be sure, a culture gained by the use of a new sort of material, but the essentials insisted on were keenness of observation and accuracy of execution.

The Need for Vocational Training.—In the past ten years, however, the vocational aim has been rising into prominence. Undoubtedly, the strong materialistic tendency of the present age has had much to do with this rise. The question *cui bono?* insistently challenges every idea to-day, and the manual training course of study has not escaped the challenge. Mental growth, the effect of any course of study on the development of the intellect, is hard to measure. The things of the spirit are elusive when it comes to defining them in terms of the yardstick. The advocates of manual training have not always been able to point to concrete results in school sufficiently

striking to justify the early claims for its incorporation into the course of study. It has not been conclusively shown that intellectual stamina has been developed by manual training of different calibre from that built up by the study of the ordinary school subjects. The training in deftness of hand has, however, been marked. This result is so desirable and is so valuable an asset for any and all walks in life that no one suggests to-day the elimination of manual training from our courses of study. The tendency is rather to emphasize in a greater degree this skill of hand and to organize in the schools courses which shall train the hand for a particular line of activity, in short, for a life vocation. A second and more fundamental reason for the rise of vocational training emerges out of the democratic spirit. The spirit of democracy, which is a regard for the individual's rights and capacities, is steadily growing, the world over. This spirit has a vital influence on education. Men differ in their ability, both mental and physical, and in their tastes and aptitudes. Therefore, their education should vary in accordance with these differences. The highest ideal of life is the development of each individual to his fullest capacity. Especially in a republic, where every man has the privilege, equally with every other, of being a ruler, each man's freest development should be the ultimate goal. For this development education stands and schools are established. Because the individual units in the schools differ among themselves, the schools which train them should differ. The first years of school should teach the same things to all children; they should give the tools of learning, ability to read, to write, and to cipher. At the ages from twelve to sixteen (authorities differ as to the wisest time) education should be differ-

entiated. Those whose life activity is to be predominantly mental should go forward to study from books and in laboratories. Those who are to be the toilers of the world, who are to make their living primarily with their hands, should be given an education or a training for the most part in shops, in actual contact with things. By this course of reasoning, the conclusion is reached that different kinds of vocational schools or courses should be provided to meet the varying needs of the individuals of a democratic society.

The Duty of the State.—Granted that schools should differ, the practical question soon arises as to the duty of the State in providing at public expense these different types of schools. Is it possible for the State to train for every occupation, when occupations are so varied? Should not the individual's preparation for bread-winning be left to his own initiative? Is there not danger of weakening the will and of bringing up a generation which will look to a paternalistic State for everything, if the policy of State-supported vocational schools is adopted? These are queries which inevitably confront those who consider this subject. They cannot be definitely and finally answered as yet. We are in an unsettled stage as regards vocational training in the public schools. Many theories are held and many experiments are going on to test the wisdom of these policies. At the present time, the idea of vocational training is popular. The people are willing to spend money for such training, but the provisions already made must be regarded as tentative and experimental. The American people will undoubtedly support any movement for the promotion of the general welfare. If, then, the result of study and reflection and of actual trials proves to the satisfaction of

the public that vocational schools and vocational training in the high school make for the prosperity of the country, our public school system will, beyond question, be reorganized so as to train for definite callings. An occupation in life is absolutely essential to every one. The world has no place for the idle. "If one will not work, neither shall he eat." These are fundamental principles. The State, therefore, should see to it that every one is trained for an occupation. Many States of the Union have committed themselves definitely to vocational education in the higher realms by the establishment of State universities where are trained, at public expense, lawyers, physicians, dentists, engineers, teachers, etc. The only reason for providing such training by the State, and omitting the training for the ordinary trades of the world, such as those of the carpenter, plumber, or bricklayer, is that the professions are more necessary to the welfare of the State. This proposition would be difficult to substantiate. From this point of view, then, either the State must abandon its long-established policy of educating for the professions or it must enlarge the scope of its endeavors so as to train its humblest citizen to the limit of his capacity. Judging from present conditions and tendencies, the latter will be the alternative chosen.

The Elementary School.—At this moment the movement toward vocational training at public expense is more marked in the region of the elementary school than in that of the high school. At least three States, Massachusetts, New York and Wisconsin, have already enacted laws providing State aid to communities which establish trade or vocational schools. The State of Massachusetts pays half the running expenses of such a school, while

New York pays five hundred dollars for the first teacher and two hundred dollars for each additional teacher. Worcester, Springfield, Newton, Lawrence, Beverly, and New Bedford, in Massachusetts, and Rochester, Albany, and New York City, in New York, are among the communities which have opened schools under these statutes. Boys are admitted at the age of fourteen and are taught for two years the rudiments of such trades as carpentry, plumbing, printing, electrical construction, and machine-shop practice. This instruction for two years shortens by so much the period of apprenticeship for those who enter the factory at sixteen. The Worcester (Massachusetts) Trade School offers a four-year course, and aims to train competent journeyman machinists, cabinet-makers, and pattern-makers. The Wisconsin legislature of 1911 passed a law giving State aid to communities which establish industrial, commercial, continuation, and evening schools. This State aid amounts to one half the total cost of the school.

The High School.—The high school has not responded so quickly to the public demand for vocational training as the elementary school. But few high schools are to-day offering courses which are avowedly vocational, except the commercial, teacher-training, and agricultural courses, already spoken of. A few definitely vocational courses are to be noted here and there over the country. The high school at Menomonie, Wisconsin, offers courses in architectural drafting, machine drafting, machine-shop practice, plumbing, and bricklaying, for pupils in the last two years of the high school, which approximate trade courses. The mechanical work of the first two years in the Menomonie High School comprises joinery, wood-turning, pattern-making and foundry-practice, and

mechanical drawing. The drawing of these two years is preliminary to special trade training, designed to give familiarity with the shop tools used in the ordinary factory. It is, therefore, general in its character, while the work of the last two high school years is special, preparing for the trades mentioned. The courses for girls in cooking and sewing in the Menomonie High School, or in domestic science and domestic art, as the present broadened courses in these subjects should more properly be called, are elaborately worked out. The domestic science course includes, besides cooking and sewing, a study of food values, dietaries, marketing, household management—comprising sanitation and ventilation, artistic furnishing of the home, keeping of household accounts, the problem of domestic labor, and apportionment of income. The domestic art course takes up plain sewing and garment-making, dress-making, millinery, and art needle-work. These courses for the girls are vocational in the best sense, preparing the high school girl for home-making, which will be the life vocation of most of them.

Spread of the Movement.—The Menomonie High School is typical of an increasing number of high schools throughout the United States. Wherever high schools have introduced so-called manual training or industrial courses side by side with the ordinary or academic courses, the development of these new courses has been similar to that described above. In the Eastern, North Central, and Western States, the majority of high schools in cities of more than twenty-five thousand inhabitants are to-day giving such instruction, while the movement is rapidly spreading to include the smaller cities. In more than half of the one thousand three

hundred and forty-eight cities in the United States, having four thousand inhabitants and over, manual training finds a place in the public-school system, according to the report of the United States Commissioner of Education for 1908-9. While these courses are not often described as vocational, they certainly have a closer connection with life outside the school than the cultural courses of the old high school.

Practical Difficulties in Organizing Trade Instruction.—

One serious obstacle in the way of giving trade instruction in the public schools is the great diversity of occupations. The school cannot undertake to turn out tradesmen for every trade, as the numbers preparing for the separate trades would be so small in all save the largest cities as to make the employment of special teachers for each group a financial impossibility. Many pupils of the high school age have not yet determined upon their life pursuit. However desirable it may be for youth at as early a period as possible to settle upon their life work, the spirit of democracy keeps alive the young man's ambition and keeps open the way before him, so that much experimentation is gone through before the youth finally settles down to his permanent calling. Such being the conditions in our society, the most feasible policy for high schools to follow in vocational training would seem to be to afford instruction in the fundamental processes of all trades, namely, wood and iron, together with business training, now given under the head of commercial courses. Such instruction as is now offered in the Menomonic and similar high schools helps the youth to find himself vocationally and gives him, besides, a training in the elements of any calling which deals with wood, iron, or commercial paper. At the same time, in certain

localities where the industries of the community are well-defined and specialized, as the textile industry at New Bedford, and the machine tool industry at Cincinnati, the schools may well emphasize industrial courses which will prepare for the vocations of the community.

Co-operation Between High School and Factory.—A plan of co-operation between the high school and the factory for carrying on vocational training is receiving much attention at the present time. This scheme was first worked out by Dean Herman Schneider of the engineering department of the University of Cincinnati, for the purpose of giving engineering students actual practice in machine shops, co-ordinately with their theoretical study in the university. The plan was first put into operation in a high school in Fitchburg, Massachusetts, in the fall of 1908. In the Fitchburg Plan, as it is now called, the co-operative and industrial course is four years long, the first year consisting of all school work, as follows: English, arithmetic, algebra, and drawing, both free-hand and mechanical. At the beginning of the second high school year, the boys taking this course are divided into pairs and half their time is spent in the school and half in those factories of the city which are co-operating in this movement. One boy of the pair spends a week in school while his mate is in the shop; the second week, places are exchanged, the boy who was in school the first week going to the shop the second week and the boy from the shop to the school. This plan continues for three years. The boys sign an apprenticeship agreement and are paid apprentice's wages for the time spent in the shop. The shop work is the ordinary practice of a machinist's apprentice in the operation of the drill, the lathe, the planer, shaper, and milling machine, to-

gether with bench and floor work. The school work includes English, shop mathematics, comprising algebra and geometry, physics, chemistry, mechanism of machines, drawing, civics, and first aid to the injured. This course is avowedly and specifically vocational and has the advantage of combining in equal amount theory and practice. The boys who complete this course will be both practical and theoretical machinists.

Technical Arts High Schools.—Besides the plans for vocational instruction already described, namely, the introduction of vocational courses or semi-vocational courses in existing high schools, side by side with academic courses, and the Fitchburg co-operative plan, a third tendency has been marked in the past fifteen years. This is the establishment, in cities large enough to need more than one high school, of technical, commercial, and practical arts high schools, such as the Indianapolis Manual Training High School, the Crane and Lane Technical High Schools of Chicago, the Cleveland Technical High School, the Boston High School of Commerce, and the Washington Irving Technical High School for Girls of New York City. The earlier schools of this kind, like the Indianapolis Manual Training High School, which was opened in 1895, were semi-vocational. Their courses, that is to say, gave large opportunity for shop work and drawing for boys and for cooking and sewing for girls, but they did not definitely say that they would prepare their students for life vocations. Many of their graduates have gone forward to schools of engineering, while the great majority of them have taken up some mechanical pursuit for which their high school course was a preparation, more or less direct. The tendency in such schools seems to be, however, increasingly

toward specific vocational ends. The Cleveland Technical High School, for example, states its immediate ends as follows: "(1) To prepare youth of both sexes for a definite vocation and for efficient industrial citizenship; (2) to help men and women already engaged in a vocation to better their condition by increasing their technical knowledge and skill." The plan adopted for preparing boys for definite vocations in this school is, first, to give them a general but intensive course in manual training for two years, consisting of turning, cabinet-making, pattern-making and foundry practice and forging. At the end of two years, if peculiar adaptability in any given direction becomes evident to pupil, parent, or teacher, specialization along this line is permitted in order that upon graduation a pupil may be better fitted for his life work. The Boston High School of Commerce was created to give boys a specific preparation for commercial life. It aims throughout to develop a commercial spirit and aptitude for business. The course of study permits a choice of subjects that will enable a pupil to prepare for one of the three larger divisions of the commercial field, namely, secretarial work, buying and selling, and accounting. Besides the usual subjects taught in commercial courses, such as arithmetic, book-keeping, stenography, and type-writing, the broad character of this school may be noted from mention of the following branches of study: commercial geography, local industries, economic history, commercial law, commercial design, business organization, commercial policy, accounting and auditing, consular service, Spanish, French, and German. The students are taken from time to time to visit the commercial institutions of Boston, and, during the summer vacation, the school secures positions for its

students in offices, thus carrying out a practical sort of co-operation between the school and the business world. The Washington Irving High School for Girls, in New York City, is a vocational school which offers three-year technical courses, designed to prepare its graduates for the following occupations: stenographers and typewriters, dress-makers and embroiderers, milliners, designers, printers, bookbinders, and library assistants. The Boston High School of Practical Arts for girls has a four-years course in both academic and industrial subjects. The industrial department offers three courses: dress-making, millinery, and household science, aiming to give ideals, taste, and skill which shall have money-earning value for the possessor.

Agricultural High Schools.—Agricultural courses in high schools and special agricultural high schools are another type of vocational training, advocated widely throughout the United States at the present time. The States of Minnesota and Michigan have adopted the policy of offering agricultural courses in high schools already existing in rural communities or small cities. This course includes a study of soils, seed selection, crop rotation, animal husbandry, fertilizers, and farm accounts. Wisconsin has set up five county agricultural high schools to the support of each of which the State contributes four thousand dollars a year. The Southern States, notably Georgia and Alabama, have established an agricultural high school in each congressional district. But, as in the case of industrial high schools, the choice between separate agricultural schools and agricultural courses in ordinary high schools is not yet definitely made.

Three Lines of Tendency.—Three distinct lines of tendency are thus marked out in vocational training in sec-

ondary schools: (1) vocational or semi-vocational courses, side by side with the traditional academic courses, (2) co-operative courses between the high schools and the factory, and (3) the separate high school, specially vocational in its aim. The future development of vocational training in high schools will undoubtedly be along these same lines. In the larger cities, where several high schools are required to accommodate all the secondary pupils, special technical or vocational high schools are bound to spring up and persist. Some have seen a menace to ideals of democracy in this segregation of our youth, fearing that the result would be a development of classes leading to ill feeling and caste. But democracy can never mean equality in intellect or ability; it can only mean equality of opportunity. The call for vocational training, both below the high school and within it, is the most democratic movement of the age, because it brings the service of the public schools to every boy and girl whatever their tastes and aptitudes. The highest educational ideal must be the utmost development of which the individual is capable in the direction which the individual chooses. This is just what elementary trade schools and vocational secondary schools will offer. As long as the way is open at the top for the individual to go on to a broader training, vocational schools will not develop caste. It is too early in its history to predict the fate of the co-operative school, but the idea to carry on simultaneously theoretical instruction and shop practice under actual factory conditions seems sensible and practical. Without question, the third type of vocational training described is bound to spread most widely, namely, the introduction of special vocational courses as a part of the curriculum of the high school in the ordinary

city, especially where shop and laboratory equipments are added to the school. It would seem feasible for such high schools to offer satisfactory vocational courses in the following occupations: clerks, book-keepers, stenographers and type-writers, draughtsmen, electricians, automobile workmen, machinists, pattern-makers, dress-makers, milliners, house-keepers, lunch-room assistants. To this list may be easily added other industries demanded by local conditions, such as textile workers, pottery workers, cabinet-makers, etc. But the above list of occupations is general in its character, applicable to living conditions everywhere.

Result of Vocational Trend in Education.—A marked result of the vocational trend in education is the modification of the traditional cultural courses in our high schools. The point of view of these courses has in the past two decades been severely criticized as being excessively academic, as looking within and away from life outside school walls and concentrating energy on refinements of scholarship rather than on service to humanity. In this criticism, the college and university have been charged as chief offenders in their prescription of entrance requirements, which prevent youths from following the bent of their natural tastes and native capacities. Great changes have been made in these college entrance requirements in conformity with the spirit of the times. Whereas, a generation ago, a youth to enter college must offer preparation in Latin, Greek, and mathematics before everything else, to-day many options are granted. Certain constants are still required but these are not the same as they were twenty-five years ago. Practically the only constants now are English, algebra, and geometry, to which is added a wide choice of elective

requirements, including modern languages, classics, history, and science. At the present moment the colleges are besieged with the demand to accept for entrance any high school subject whatsoever when it has been studied seriously and thoroughly. The colleges and universities have not yet capitulated to this demand, but the attack well illustrates the effect of the vocational emphasis. The vocational courses offered in the ordinary high school have not as yet been widely accepted as fit preparation for entrance to college, but the presence of these courses side by side with college entrance courses has had an influence on the point of view and methods of teaching of the latter. In physics, chemistry, botany, modern languages, one notes a well-marked tendency to give instruction which shall touch the world outside the school. Two courses in physics have been proposed in certain high schools, one based exclusively upon measurements and preparing for college, the other aiming to give a practical acquaintance with the every-day uses of light, sound, and electricity. Chemistry is treated as industrial chemistry and the chemistry of foods. Botany leans toward agriculture and studies plant diseases as well as plant structure, while German and French are taught in many high schools by a natural method, with a definite attempt to equip the student for using them in conversation. Whether colleges will accept this practical view of high school methods as fit preparation for advanced study or not is, as yet, an open question; but no doubt can exist as to the effect of the trend toward vocational training on educational thought in both high school and college.

Vocational Guidance.—An interesting development in connection with the training of youth is the recent movement for vocational guidance. This is an attempt to

provide means for enabling young men and women to give some study to that most important of all decisions, the selection of one's life occupation. Young men the world over have in the past chosen the calling of their fathers, or, upon arriving at the proper age for entering the productive field, have followed the line of least resistance and taken up the work which lay nearest at hand. The result has been choices of occupations by chance, with many misfits and failures in life. With the growth of the conviction that education should fit directly and specifically for life's activities, has developed irresistibly the truth that the school cannot prepare a youth for a vocation unless the youth knows what vocation he wishes to follow. This is too important a matter to be left to the whim of the boy, or to chance; hence the movement for vocational guidance. The method to be used in this attempt is the study of the different types of life activities in which men find themselves. For this purpose, the library may be consulted and books descriptive of industries and occupations read. Excursions to factories and business centres may be taken, which shall disclose to the growing boy both the desirable and the undesirable features of various callings. Addresses may be given by business and professional men, telling of the needs of their vocations and of the demands upon those who choose to enter them. Teachers and parents should make a more systematic study of the youth's abilities and characteristics, so that the advice which these leaders of youth naturally give may have a basis in fact, and not be merely guesswork. If vocational training is to be the educational policy of the future, vocational guidance is absolutely necessary to the security of any permanently valuable results from school training for life occupations.

Summary.—To summarize this chapter: the tendency is strong to require of secondary schools a closer articulation with life outside of the schoolroom. While this tendency is influencing the high school in every department and making over its thought and methods of instruction, vocational training is entering the school in three ways: (1) by the introduction of studies, vocational or semi-vocational in character, in the existing type of high school (2) by co-operative courses of study between the school and the factory (3) by the establishment of special high schools, distinctively vocational in aim. While it is impossible to predict the future, it is altogether probable that the vocational trend will be permanent and that secondary schools from now forward will study more carefully than in the past the future occupations of their students and plan their courses of study accordingly.

CHAPTER XXIV

PRACTICAL ARTS FOR GIRLS

CHARLOTTE JOY FARNSWORTH, PH. B.

PRECEPTRESS OF HORACE MANN SCHOOL, TEACHERS COLLEGE,
COLUMBIA UNIVERSITY

Double Aspect of High School Subjects—Theoretical and Practical.—Broadly speaking, the work done in high schools may be divided into two main groups, one dealing with principles, which may be called theoretical, and the other dealing with the application of these principles, called practical. Both the theoretical and the practical aspects of the various subjects enter into all courses, though some, like mathematics, the sciences, and, in some cases, the languages, emphasize the theory or underlying principles. For example, mathematics, though taking many of its illustrations from practical life, is studied almost wholly for the principles involved; science also, while employing practical illustrations such as heat, light, and electricity, utilizes these illustrations not so much for their practical value as illustrative of scientific principles. Even language tends to emphasize structure and grammar.

The practical courses, domestic science, domestic art, the fine arts, including music and literature, emphasize the acquisition of a technic and of material. For instance, domestic science treats of the effect of heat upon food, of food composition and nutritive values, but makes

its chief aim learning how to cook. Domestic art deals with the study of textiles and materials, yet skill in making garments and hats is its aim. The fine arts, while dealing with the principles of color and form, are mainly concerned in acquiring the technic for making beautiful objects. In literature the examples of lyric poetry and the drama are memorized, sometimes acted and sung. It will be seen in both theoretical and practical forms of work that the interest and aim are the mastery of the subject.

Need for New Valuation of Studies.—On the contrary, the practical arts course described in this chapter emphasizes neither the theoretical nor practical forms of work, but propounds a distinct new question for non-professional schools—What is this study worth? How is it to be utilized in every-day life? Thus, what was secondary and incidental in the other courses is made fundamental and central in this course. We are establishing a new valuation for the high school studies. Instead of the subject being central the pupils are made central. What is necessary in order that they may conduct their lives with the greatest efficiency and satisfaction is being considered. The individual's health, shelter and clothing, social relations and conduct, and enjoyments become the focal points of the work. These divisions generally have both theoretical and practical courses underlying them, such as science courses, domestic science, domestic art, and fine arts courses, while two of them, social relations and enjoyment, closely as they are knit to conduct, the three-fourths of life, have no systematic work upon which they can rest, though much is given, largely through the personality of teachers and the spirit of the school.

By taking this work in connection with definite situations in which the pupil finds himself, the complex theoretical problems of ethics and psychology are avoided and at the same time methods of procedure and ideals of conduct of the utmost practical value are suggested.

A Course of Study.—Following is a description of such a course being given as an elective to senior high school girls, demanding two forty-minute periods per week in recitation throughout the year. Two points credit is given, the total credit required for the year being fifteen points.

The subject is treated under five divisions:

1. Economics of Clothing.
2. Home Sanitation.
3. House Furnishing.
4. Social Relations and Conduct.
5. Recreation and Enjoyment.

Each division is conducted by one of the regular teachers of the staff, the first topic being treated by the teacher of domestic art, the second by the teacher of cookery, the third by the art instructor, the next by the preceptress, and the last by a supervisor. Special lecturers give their services for certain lessons, *e. g.*, that on "Furniture," the one on "Pictures," the two on "Health; Its Social Significance," the talks on "Settlements and Social Service," and on "Customs and Courtesies of the Table." Throughout the course lecture slides are used, a model apartment in the school serves as a laboratory, and illustrative visits are made frequently. A detailed description follows:

1. **Economics of Clothing.**—The general topic of the first twelve lessons is "How to Clothe Ourselves."

Each girl is urged to have an allowance of her own that she may at once assume some responsibility in regard to spending money, and learn the self-control that comes from handling and accounting for a definite amount of money. A complete wardrobe is planned and the different articles of clothing proportioned. The cost of each and the time it might reasonably be expected to wear are considered. Allowances of different amounts are planned, varying from one hundred and fifty to eight hundred dollars.

Working from this personal element, family budgets are next discussed. The work is considered from the student's station in the community, taking Mrs. Richard's "Cost of Living" as a basis, the allowance for the clothing of the family is apportioned, the cost of men's and children's clothes being also studied.

The study of textiles is taken up from the stand-point of the shopper only. Each girl writes for samples of different kinds of material. These are examined carefully as to quality, width, and price per yard, then compared with standards of good quality, that all may become familiar with the appearance, the feeling, and the name of these materials. Simple physical tests are made for judging and distinguishing different kinds of materials.

The responsibility of the shopper both in relation to the quality of goods offered on the market and also to the conditions under which they are produced is next discussed, and the class is taken on a shopping trip where their attention is called to simple good styles of clothing and materials.

Notes are required throughout this series of lectures and a test is given at the end.

2. **Home Sanitation.**—The second series of lessons is devoted to the topics of the new problem of the home in the city, apartments and flats, home sanitation and management, home nursing, and emergency work.

The series opens with a discussion of how to select a home. The significance of constant moving which breaks up home associations is considered. Taking for granted that every normal family desires to own the home in which they live, emphasis is laid upon this permanent abiding place, though most of the considerations in its selection will apply equally well to the selection of a house for renting in either city or country. Attention is drawn to the location of the house with reference to water, drainage, and accessibility.

Special attention is given to the structure of the cellar and its importance in governing the quality of air. Means for producing satisfactory ventilation, and the value of fresh air and cool temperature as seen in the effects of open-air schools and sanitariums are discussed. The planning and furnishing of the kitchen and pantry, with a comparison of various floor coverings and wall finishes, is considered.

Next we turn to the economic problems which confront the house-keeper: the planning and keeping of the family budget, correctly proportioning her expenditures to a given income, banking, and the much-discussed servant problem, its causes and possible means of solution.

The final lessons in this series of the course are devoted to what every one should know in home nursing and giving first aid to the injured. The topics selected are the furnishing of a sick-room; the making of a bed and care of patient in bed; the staunching of bleeding with practice in applying the simple and most used bandages;

how to revive a person in case of fainting, drowning, or asphyxiation; treatment and care of cases of burns, poisoning, stings, bites, sprains, and fractures.

Complete and carefully kept notes are required of the students throughout this series and practice work in first aid to the injured is demanded.

3. House Furnishing.—The third section of the course aims to open the eyes of the students to the possibilities of good or bad taste in the home.

Some of the students never having been in the art classes, "Line" and "Color" in their general aspects are treated first, in order that the meaning of terms used in the succeeding work may be known and appreciated.

Recognizing color as the most potent factor for good or for ill, we first consider "Choosing a Color Scheme." This is followed by lessons on the treatment of the walls of the room, including wood-work, wall coverings, portières, and curtains. Then follows "Floors and Floor Coverings." The fact that floors and walls should be considered as backgrounds is especially emphasized, and ways to achieve this desirable end are shown. Then follows a lesson upon "Furniture: Its Proportions and Appropriate Ornamentation." Next comes "Pictures and Casts: Their Choice and Arrangement." The negative side of the subject is shown in a lesson on "What to Avoid." The most common and flagrant lapses in good taste are discussed, the positive side being reiterated by fine examples shown in contrast to objectionable ones.

Practical problems in "Line" and "Color" are given. For example, early in the series the girls are asked to draw out the floor-plans of their own rooms, placing the doors and windows and the chief articles of furniture;

then the side walls, showing the spacing and arrangement of furniture and pictures; also a description of the color scheme. The last problem asks for a description in words or by drawings, indicating what changes, if any, they would make in their rooms if free to do as they pleased.

The entire series is fully illustrated by means of lantern slides, fabrics of many colors and textures, wall-papers, rugs, and whatever can be brought in to clarify the subject and make it an experience instead of mere word knowledge. To this end, notes are not taken in class—the desire being to leave the girls free to see, to feel, and to enjoy—but note-books are kept, and at the end of the subject they are asked to write a paper upon some one of the topics discussed, wherein they shall show their general intelligence and appreciation.

4. **Social Relations and Conduct.**—The aim of the fourth division of the course, "Social Relations and Conduct," is to discover how to increase the effectiveness and pleasure and reduce friction when individuals meet. These ends are sought by making the student more aware of herself as a social factor, showing the meaning of, and how to attain, the best personal appearance, health and manners, and how to exercise this personality in the home, the school, and society.

Special lectures are given on health, the significance of manners, and social service. The lesson on "Courtesies and Customs of the Table" is considered as a bit of laboratory work and conducted in a model dining-room, the different members of the class taking turns being hostess, guests, and waitresses, and putting into practice immediately the points of etiquette and graciousness emphasized.

The other lessons of the series are carried on by means of special topics. For example, the five typical school parties are assigned, each one, to two students who are instructed to prepare and have written on the blackboard before the recitation, an outline of the committees and their duties necessary to run each party. The whole class is told to be ready to criticise, stress being laid upon the wisdom of suggesting something better in place of the part particularly criticised. In this manner are worked out skeleton plans for the giving of these various parties, plans which can be used in all future school parties.

The series ends with special lectures on the opportunities for social work open to high school seniors and graduates having leisure and the desire for regular social occupation.

5. Recreation and Enjoyment.—The characteristic feature of the fifth and last division of the course is that it deals with those forms of conduct that rise out of the free and spontaneous desires of the students, rather than those that are conditioned by necessity for food, clothing, or social relations. What the pupil does in a leisure period expresses character in a way no other work can, for this reveals taste, desires, and ambitions free from the pressure of outside necessity. Because this work is spontaneous and self-expressive it is perhaps the most highly educative. The need for this work will be seen when we consider how few are born with that supreme talent or desire which forces the one who possesses it to become the artist or scientist. Many more acquire a taste through example or the exigencies of their environment, but the large majority of people have no positive guidance as to what they would most enjoy doing.

Hence, for lack of the right stimulus, they go through life without discovering the activities that would have given them the greatest pleasure and profit. It is the aim of this part of the course

1. To survey the chief forms of those self-activities that fill up the leisure of most people and

2. To organize systematically our leisure time in order to get the highest enjoyment, as we do our business activities in order to get good results.

Under the first head "outdoor activities" are considered, and the emphasis is laid upon the value of having a hobby, such as birds, flowers, stars, or interest in natural scenery, historic places, or in a knowledge of the game, as in sports.

The second head is considered from two aspects, that of "the productive activities," the absorbing interest that comes from making beautiful and practical objects from wood, iron, clay, or by weaving or painting, giving a zest to what is done, rarely equalled by other activities and requiring skill, energy, and effort for their accomplishment. On the other hand, much of our leisure is spent in activities that must be restful in character, hence another aspect deals with "appreciative activity"; how to get the most out of reading, poetry, or listening to music; how to get the most out of the opera and theatre, to make museums and exhibits not mere pastimes, but genuinely stimulating. It is obvious that the subject-matter of such courses must be largely determined by the conditions under which the pupils live, city or country, north or south.

Following is a syllabus of the practical arts course offered in a city high school, the numbered topics for each lesson being given.

PRACTICAL ARTS

Syllabus of a Course for Senior High School Girls.

- I. Economics of Clothing.
- II. Home Sanitation and Management.
- III. House Furnishing.
- IV. Social Relations and Conduct.
- V. Recreation and Enjoyment.

Practical Arts

Throughout the year, twice a week, sixty sessions

I. ECONOMICS OF CLOTHING:

Aim.—To plan an allowance, to learn something about textile materials, and also how to shop to advantage.

1. Planning a wardrobe. Different articles of clothing proportioned.
2. Cost of different articles.
3. Comparison between the cost of bought and home-made clothes.
4. Comparison between allowances of \$150—300—500.
5. Proportioning the allowance for the clothing of the family.
6. Planning the clothing for the family.
7. Materials, kinds, cost, value.
8. Cotton, linen.
9. Wool, silk.
10. Simple tests for judging materials.
11. How to shop and where to shop. The moral responsibility of the consumer.
12. How to make clothing last long and remain in good condition. Some hints as to the relation of clothing to beauty and health.

II. HOME SANITATION AND MANAGEMENT:

General Aim.—To study the fundamental principles of home sanitation and management, and home care of sick and emergency work.

1. Definition of a home: Owning one's own home; types of homes—city and suburban; the economic aspect of

- rent paying. The suburban home—study of the site. The facing of the house; drainage; elevation; setting out of trees; beautifying town houses and lots.
2. The water supply: Sources of contamination; purification, filtration, boiling, distilling, apparatus on the market.
 3. House plans; construction of cellar.
 4. Air supply; heating and lighting.
 5. Disposal of waste: Household garbage; sewerage systems; care of plumbing.
 6. Marketing.
 7. Food sanitation; the milk problem; selection and care of milk.
 8. The cleaning of the house.
 9. Household accounts; division of income. Banking.
 10. Planning the work of the home; making the menus; the labor problem.
 11. Home nursing: Furnishing and care of sick-room; guarding against contagion; bed making; care of patient in bed.
 12. Care in cases of wounds and bleeding; bandaging; stings, burns, and poisoning.

III. HOUSE FURNISHING:

Aim.—To study the principles underlying good taste and economy in household furnishings.

1 and 2. Line.

Study of the walls of a room with reference to spacing, proportion, beauty of line.

Division of wall spaces.

Placing of picture moulding, frieze, dado.

Placing of furniture.

Hanging of pictures.

3 and 4. Color.

Its properties, hue, value, intensity.

Effect of one color upon another.

Complimentary colors.

How to subdue a color.

Color vibration.

Warm and cool colors.

5. Choosing a Color Scheme.
The application of 3 and 4 to the walls and furnishings of the home.
Colors suitable to different rooms.
6. Walls, portières, curtains.
Good and bad design in wall-papers or hangings, and in textiles.
Wall finish suitable to hall, dining-room, living-room, bedroom, kitchen.
7. Floors and floor coverings.
Rugs vs. carpets.
Color and design.
Wearing qualities of the different kinds.
Care of floors.
8. Furniture.
Construction.
Proportions.
Good lines.
Appropriateness.
9. Pictures, casts, and small ornaments.
Choice of pictures.
Framing a picture.
Hanging a picture.
Wise use of casts.
Value of small ornaments.
10. Accessories.
Conveniences.
Special arrangements for use or beauty.
Clever contrivances.
11. What to avoid.
A chapter of "Don'ts" based upon observations made by teacher and students.
Illustrations of good substitutes for these.
12. Summing up.

IV. SOCIAL RELATIONS AND CONDUCT:

Aim.—To study how to increase the effectiveness and pleasure and reduce friction, when individuals meet.

The Individual.—I. Health: Care of the body, cleanliness, its social significance.

2. Health: Effective exercise, diet, rest.
3. Manners: The means of social expression.
- The Home.—4. Courtesies and customs of the table.
5. Celebrations and festivities.
6. Intercourse with elders.

The School.—7. Christmas fair.

Class party.

Senior play.

8. Basket-ball game.

Swimming meet.

Society: Opportunities in.—9. Settlement work.

10. Other social service.

V. RECREATION AND ENJOYMENT:

Aim.—To get the most out of our free time and the opportunities given, through widening, intensifying, and clarifying our tastes. Value of plan, versus drift, in our leisure time.

Outdoor activities.—1. Walks with special interests or hobbies, such as birds, flowers, stars, photography.

2. Sports.

3. Excursions.

Productive activity.—4. With tools, work in wood, iron, clay; printing, weaving.

5. Painting, decorating.

6. Playing and singing.

Appreciative activity.—7. Reading, poetry, fiction.

8. Listening to music, home, concert.

9. Opera.

10. Theatre.

11. Museums and exhibits.

12. Summary of course.

Formation of standards in living, doing, and feeling.

CHAPTER XXV

PSYCHOLOGY IN THE HIGH SCHOOL CURRICULUM

IRVING ELGAR MILLER, PH.D.

DEAN OF PROFESSIONAL WORK, STATE TEACHERS' COLLEGE, GREELEY,
COLORADO

Present-Day Interest in Psychology.—We live in an age of intense popular interest in psychology. There is a rapidly growing feeling that whether a man's chief pursuit be practical, philosophical, or religious, he can understand it properly only if he pay deference to the teachings of psychology. In every walk in life from the most blatant charlatanry in medicine, religion, and advertising to the most profound and serious problems in therapeutics, theology, business methods, social welfare, criminology, and education, we are seeking to control practice by reference to the principles of psychology. At first but a single topic in the domain of philosophy, psychology has now become a central science.

Relation of Psychology to Other Subjects.—In order that we may appreciate the value and significance of psychology in relation to the life and thought of the day it is worth while to work out more fully its central relationships with other interests both theoretical and practical. For a long time the students of epistemology and logic have found the analysis of the mental processes necessary to any rational solution of the problems of reality and truth. Writers on ethics have customarily incor-

porated into their works some account of the relations between impulse, feeling, and will; and they have found necessary considerable analysis of the basis, value, and efficiency of motives. With the advent of the genetic point of view, this analysis has broadened out to include not only considerations of child development, but also the racial or evolutionary element in the moral life. Students of education from the time of Pestalozzi, Herbart, and Froebel to that of Colonel Parker and John Dewey have been continuously psychologizing the content, method, and spirit of instruction, until now one cannot adequately prepare to teach without knowing something of analytic, physiological, functional, genetic, social, and clinical psychology. Sociology, history, and anthropology are no longer formulated in terms that ignore the large part played by the psychic factor. Even the typical blindness of justice, hitherto regarded as a specially sacred characteristic, is having to give way before the open eye of psychical insight into the nature of the criminal and the vital motive principles of reform. Criminal law and court procedure are both being gradually reconstructed in the light of psychological science to serve more adequately their true function within the social whole. The science of æsthetics is impossible, and not to be differentiated from a set of interesting speculations, except as it is based upon careful investigation and analysis of the psychological principles of beauty which underlie music, painting, poetry, and the other fine arts. Religion, the most intimate of our vital interests, is in our day yielding to psychological analysis and thus finding new methods of presentation better adapted to the whole nature of man and new bases of appeal to his conscience and his reason. In the science and the practice of medi-

cine the psychic element is receiving wider recognition as an important factor both in the cure and the prevention of disease. The world of business, in attempting to make its activities more scientific in character, is looking not only to the sciences of economics and sociology for help, but also to the science of psychology. Consequently advertising and salesmanship are being reduced to fine arts instead of being left for one to pick up by chance in the routine of business. Even the rascals in business and professional life are seeking to employ psychology for the better realization of their selfish ends through the perversion of the scientific knowledge of the laws of attention, persuasion, suggestion, hypnotism, etc. The natural sciences, which have so long prided themselves on being purely objective, are beginning to realize that they are in part psychologically determined. The facts, truths, and organizations of material which they embody are not mere correspondences with external reality, but represent selections of material and solutions of problems under the stress of motives of human interests, human needs, and human values.

In the past the most intimate connections of psychology have been with philosophy. Its independence from philosophy was not emphatically declared until 1879, when Wundt founded the first psychological laboratory. But, if we can judge by the organization of college and university faculties, the actual independence of psychology is a very recent realization. While taught in many cases by a specialist, psychology has customarily been classified as a subject in the department of philosophy. At the University of Chicago the department of psychology was not actually separated from that of philosophy until 1904. This is typical of the situation in universities in

general, though some may have effected the separation earlier and there are some in which the separation has not yet been effected. Doubtless for administrative reasons in some of the smaller universities and in many of the colleges psychology and philosophy have to be combined in one department. Even where this is the case psychology is becoming quite generally independent of philosophy and is more and more free to develop along its own lines. The influence of the physiological movement in psychology, of experimental method, and of the theory of evolution has finally transformed psychology from a philosophical discipline to one which is dominantly scientific. At the present time this scientific tendency in psychology and in its application to education expresses itself most markedly in the emphasis given to the biological and functional interpretation of conscious processes.¹ Psychology from this point of view, of course, has its philosophical implications, but it is not philosophically determined. Its range and sweep are as broad as those of human interests and human activities.

Early Recognition in Secondary Education.—When psychology was primarily of philosophic significance, either as representing a group of phenomena which demanded interpretation at the hands of the philosopher or as furnishing a type of study that was felt to be a necessary propædæutic of philosophy, it was quite natural to

¹ As evidence of this fact note the following list of recent works, all of which are dominated by this point of view: O'Shea, "Education as Adjustment," 1903; Horne, "Philosophy of Education," 1904; Angell, "Psychology," 1905; Judd, "Psychology," 1907; Miller, "Psychology of Thinking," 1909; Charters, "Methods of Teaching," 1909; McMurry, "How to Study," 1909; Ruediger, "Principles of Education," 1910; Dewey, "How We Think," 1910; Henderson, "Principles of Education," 1910.

think of psychology as an integral part of the college course and not appropriate for the secondary school. Yet it is interesting to note in this connection that psychology did receive recognition in the academies and finishing schools of our earlier history. There is good reason to think that it was quite widely represented in the curriculum indirectly in the teaching of logic and moral philosophy.¹ While we cannot get adequate statistics on the subject, it is reasonably certain that psychology was not infrequently definitely recognized in the curriculum of secondary schools under the head of mental science or mental philosophy. The records of the Department of Education of the State of New York show that in the year 1840 out of one hundred and forty-one academies in the State one hundred and four were teaching mental science. This is the largest proportion for any year between 1831 and 1895. Most likely it was just those academies which regarded themselves as finishing schools or in those courses of study which were not designed to fit for college that psychology received most recognition. The academies were "the people's colleges" of their day, and they tried to meet the fundamental needs of all the people. Religion, emphasizing the theological aspect strongly, was felt to be one of these fundamental needs. The teaching of the theological, or philosophical, aspect of religion made psychology necessary. Psychology in these institutions was then subordinate to philosophical

¹ On the curriculum of our early academies, see Brown, E. E., "The Making of Our Middle Schools." On pp. 237, 238, he exhibits the course of study of the Phillips Exeter Academy for the year 1808. In the English department are specified logic and moral and political philosophy. The curriculum of the first American High School, Boston, 1821, shows also the requirement of logic in the second and third years of a three-year course.

ends just as in the colleges. Yet it is significant that this type of institution incorporated psychology into its curriculum because it subserved the interests of the many who were not likely to go to college. With the decline of the academy and the rise of the high school as its modern equivalent, psychology quite generally lost its place in the curriculum. This may have been due to the fact that religious instruction has had little or no place in the public-school system. Not until psychology had developed along lines which connected with other interests in life could we expect it to come back into the curriculum of secondary education. With the growth of psychology in scientific character, particularly with its development of the genetic, racial, and social aspects of the subject, this new relationship to the common interests of life first appeared in the application of the principles of psychology to the science and art of teaching. There rapidly developed a strong faith, in some respects a blind and unreasoning faith,¹ in the efficacy of psychology to cure all the ills of school-room method and practice.

Status of Psychology in the High Schools.—The strong movement in the direction of the application of psychology to education has not only given added emphasis to the teaching of the subject in colleges and universities, but has also brought it into the curriculum of the high school to some extent as the means of furnishing a minimum of professional training for rural-school teachers. Just how strong this comparatively new movement in the high school is could be ascertained only by a process of

¹ I believe that psychology, while immensely important in its relation to education, has unduly occupied the focus of attention of educators to the unwise neglect, now in promise of remedy, of the contributions to be made by biology, sociology, ethics, and modern logic.

investigation. This the author undertook with results which are described below.

A questionnaire was sent out to the State superintendents of the various States and also to the high school inspectors of the State universities. Replies were received from thirty-five States, the larger percentage of them coming from the offices of State superintendents. For purposes of interpretation of these replies the States were grouped under the following heads: The Middle West, the Eastern States, the Southern States, and the Far West (Rocky Mountain and Pacific States). In several States of the Middle West psychology seems to be strongly intrenched in the curriculum of the high school. A majority of the high schools of Ohio are reported as teaching psychology. In Kansas it is reported as being taught in one hundred and fifty-five high schools, and in Nebraska the estimate is vaguely set as from one-third to two-thirds of the high schools of the State which teach the subject. In Nebraska, however, the main emphasis is placed upon pedagogy. Iowa is reported as seeking legislation this year looking to the introduction of psychology into the high school curriculum as a professional subject in the preparation of rural-school teachers. In Michigan, and also in Wisconsin to a less degree, the county training school flourishes as an institution for the training of rural-school teachers. These schools receive students directly from the elementary school as well as from the high school. Psychology is, then, taught in them to a large class of pupils who are certainly not in advance either in training or in maturity of the senior class of the high school. In the rest of the Middle West psychology is not so prominent in the curriculum of secondary schools. In the Dakotas there is reported to

be very little of it, in Indiana and Illinois there is practically none, though there may be one or two exceptions, and in the other States of this group the subject appears to be practically a negligible element in the high school curriculum. In the Eastern States psychology in the high school is practically non-existent, except in Pennsylvania where it is reported to be taught in about two per cent of the schools. Four out of eight of the Southern States reporting on this topic give psychology a place. In Kentucky the proportion of high schools offering psychology runs up to fifty per cent; in Oklahoma about thirty per cent; in Missouri from two-and-a-half to five per cent. Virginia reports psychology as taught in about twenty-five high schools. One State, namely Arkansas, is reported as seeking legislation this year which shall provide for the teaching of psychology in the high schools as a means to the better professional training of rural-school teachers. In the Far West there is practically no psychology taught in the high schools according to our reports, except in the State of Colorado, where the practice is quite general in the cities. The main purpose of psychology in the high schools of Colorado, however, does not seem to be the professional training of rural-school teachers; but the subject stands on its merits as one of value to all students, the professional aspect being incidental. If psychology has an abiding place in the curriculum of the high school, it is the conviction of the writer that it must be, as in Colorado, on account of its non-professional value rather than its professional value. When the universities and normal schools of the country wake up to a true conception of their function and responsibility they are going to devise ways and means of meeting the needs of every class of teachers. Moreover,

the time will soon come, it is to be hoped, when society will demand that the teachers of its country boys and girls shall be as fully equipped for their task as those who teach the youth of our cities.

Value of Psychology in High Schools.—To get a glimpse of sentiment regarding the teaching of psychology in secondary schools as a non-professional subject, we must return to the results of our questionnaire from a different angle. In the replies from the Eastern States, three out of eight were favorable to the teaching of psychology as a general elective on a non-professional basis. From the Southern States the sentiment was almost unanimous against the teaching of psychology as a professional subject in the high school, yet out of eleven replies two were favorable to the teaching of the subject as a general elective and another was doubtful. From the Far West the sentiment, except in Colorado, seemed to be almost unanimous against the teaching of psychology in the high school either as a professional or as a non-professional subject. In Colorado, where it has been tried for a long time, the sentiment is strongly in favor not only of continuing the policy, but also of extending it. In the States of the Middle West, even in those in which psychology is taught with special reference to the training of rural-school teachers, the sentiment in favor of psychology as a non-professional subject seems to be more clearly defined than it is for its being taught as a professional subject. It may be remarked at this point that the State University men who have expressed themselves on the subject are, on the whole, more doubtful as to the value of psychology in the high school either as a non-professional or as a professional subject than are the State superintendents.

Whether psychology in the curriculum of the high school is growing in favor or not is, on the whole, a difficult matter to determine on the basis of the reports received. There seem to be indications that the pendulum is swinging slightly in its favor, particularly as a non-professional subject for that class of students who do not expect to go to college. The question of the advisability of offering psychology as an elective in the curriculum of our secondary schools is one that must ultimately be answered in the light of its values for life. Consequently, we shall enter upon some discussion of these values.

Culture Value of Psychology.—The interrelations of psychology with all classes of problems and activities of the modern world have already been pointed out. From this point of view there is certainly a very high cultural value to be assigned to the subject. It gives added insight into the human forces and factors that are shaping the tendencies of the age. It helps the individual to put himself into sympathetic relations with many phases of life which must otherwise remain merely curious and interesting objective phenomena. Why should the high school give a large place to the sciences which throw light upon the nature and function of the body and fail to complete the circle of knowledge of the self? Man is not a physical organism merely, but a psycho-physical organism. To know the facts of the body without those of the mind is to give to them a distorted significance just as truly as is the case with mental phenomena studied without reference to the part which they play in the life and activities of the whole organism. Only the distortion is worse in the former case because that which is most characteristically human, that on which the superi-

ority of man over the rest of the animal series depends, that which makes possible progress and civilization, has been omitted from consideration in the training of youth.

Psychology has at least one very strong negative value which ought not to be ignored in our day. Among the uninitiated psychology is strangely confused with freak treatises on suggestion, hypnotism, clairvoyance, sub-conscious mind, telepathy, new thought, etc. The appetite which the popular mind has for this sort of stuff is simply appalling. The average person among the un-instructed cannot easily pick out the kernel of truth from the wagon-load of chaff that is confidently offered him by the charlatan as the latest and most authoritative deliverance of science. There is a real need that schools which reach a larger number of people than the colleges offer instruction in the great fundamentals of scientific psychology which would give some definite point of view for the evaluation of discussions in the marginal fields of the subject which, while exceedingly fascinating, are nevertheless too often wholly unscientific or at best only pseudo-scientific. Such instruction would save the warping and distorting of many lives.

Moral and Religious Value.—Psychology has a very positive moral and religious value. Its moral value comes in part through the revelation of the intimate interrelations of all parts of the self, especially the interplay of physical and mental processes with those which are more commonly considered moral. An intelligent grasp of the part played by these physical and mental processes in the determination of moral conduct helps one to apply principles of control to the realization of moral aims. It is useful to know that when the isolated resolution not to yield to some specific type of temptation

fails we may break down the force of persistent impulse by bringing to bear upon it a whole organized system of ideas with all the cumulative force of the impulsive power of the separate elements which go to make up the complex. The importance of right habits both of body and of mind is more powerfully taught by James's chapter on "Habit" than by volumes of sermons from the pulpit. To know that the social and religious impulses are normal, and deeply fundamental, gives poise and balance at the time of storm and stress when the adolescent may be facing the necessity of reconstructing his social and religious conceptions. If he has a grasp of the fundamental elements of human nature he cannot tolerate any reconstruction of his life which narrows and restricts or which robs him of the full rights of his complete normal personality. Anchoring to the moorings of the race as revealed in the analysis of the complete self, tying down to the great fundamental values which the race has achieved in its struggle upward, is likely to prove the salvation of the individual. There is, of course, considerable doubt as to the advisability of teaching to adolescents those aspects of psychology which concern most intimately their own transition stage in life. The writer is personally inclined to the view that it ought to be done; but if it is to be done it ought to be by a person of maturity, judgment, and strong moral personality. For the adolescent to know some of the peculiar physical, mental, and emotional symptoms to which he is almost certain to be subject is to fortify him against temptation, morbidness, and undue egotism. Knowledge of his own nature and the factors that are at work within his life gives sanity, poise, and self-control. Also, it gives him a rational basis for rejection of the subtle suggestions

of quack physicians who make it their business to prey upon sensitive and innocent youth.

Knowledge of Mental Processes Important.—It is important for all people, and for the student in particular, to know something of the economy of mental procedure, to understand the physical conditions of mental work, and to be familiar with the fundamental laws of psychic hygiene, including fatigue, suggestion, and mental therapy. One ought to know the simple principles of diet, rest, exercise, sleep, recreation, and cheerfulness, in their relation to mental power and efficiency.

To the student, psychology has a special value in bringing to clear consciousness the principles of observation, memory, attention, association, and thinking, upon which he can build a rational and controlled method of study, instead of following a random and chance method. High school students themselves who have studied psychology have testified to this value of the subject and have said that they wished that they had studied it earlier. To learn the art of using the mind to best advantage is a life lesson that cannot be learned too soon.

Text-Books and Other Aids to Study.—Improvement in text-books and in methods of teaching psychology have made it much more suitable for students of the high school. The older texts, dominated by philosophical and theological interests, were too analytic and abstract. The richer development of the subject within recent years and the working out of its applications to every phase of life makes it a study which satisfies a very wide range of adolescent needs. The introduction of the concrete results of experimentation and the added emphasis on the motor element have greatly enriched the content of psychology while at the same time making

it more concrete and teachable. The greater concreteness of the subject and its greater relevancy to the ordinary needs of life have been accentuated by the tendency to eliminate from elementary texts, or else to minimize the treatment of, those topics which have chiefly a propædæutic value for philosophy. In most of our books diagrams and illustrations are used freely, particularly in the presentation of the essential facts of the nervous system. Photographic reproductions of certain aspects of nerve structure abound, and models and charts can be secured for the study of all of the grosser aspects of the nervous system. Slides can be secured for the microscopic study of minuter details or for projection upon the screen with the lantern. The nature and function of the normal human consciousness is constantly illuminated by reference to the results of the study of the abnormal, the exceptional, the primitive, and the animal. The adoption of the evolutionary point of view, using as the central and fundamental principle that of adjustment, gives the story element necessary to sequence and unity of topics. From this point of view the parts of the subject are all presented not as mere descriptive and logical distinctions, but in dynamic, functional, and organic relations to one another. With the growth of the subject of psychology in scientific character, concreteness of method, and richness of application to life, it is not surprising that there is taking place a gradual change in the conception of its educational value for the high school.

Choosing Text-Books.—What has been said regarding improvement in text-books and in methods of instruction in general ought to be suggestive as to the right course of procedure upon the part of the high school teacher of the subject. But perhaps something ought to be said that

deals more specifically with the problem of teaching psychology in the high school. With regard to text-books, choose them not with reference to duplication or equivalence of college courses in the subject. Consider first of all the needs of high school pupils and the adaptability of the text to the awakening in the pupil of a vital interest in psychology. Other things being equal, choose books of recent authorship; for they are more likely to contain the results of the most recent scholarship. This is very important because psychology is a rapidly developing subject. Choose books, or a group of books, for class-room use which embody the enrichment in subject-matter and the improvement in methods which have been suggested in the preceding paragraph as characteristic of the past few years.

Methods of Teaching.—Do not be afraid to vary the order of topics from that of the text-book used if in doing so you can find a more vital point of contact with the interest and experience of the class. Most books are determined by some logical principle of organization. The logical order, however, is not always identical with the pedagogical. The student is often thrust into the study of the nervous system the first week in the course, before he feels any need of a knowledge of physiological facts in the interpretation and explanation of mental phenomena. Too often this study of the nervous system is merely a chapter in physiology, without any selection and emphasis upon the facts which are of concern in the study of mind. It should be self-evident that the chapter on the nervous system and the special senses ought to be a chapter in *psychology*, not in physiology. This it cannot be if it is taken up too early. All aspects of the mind are so closely interrelated that I am inclined to

think that theoretically it makes little difference with what topic the teacher starts the course. Problems will inevitably arise which lead out in all directions, and each discussion will clear up every other. Consequently, I should start in teaching high school pupils, or, for that matter, elementary students in normal school or college, with some topic which is central in mental experience and with which the pupil already has a great many points of contact and interest, in which there is, in other words, a great deal of latent material which does not have to be dug out of books, but rather out of the fulness of the pupil's own experience. Such topics are memory, association, imagination, habit, methods of study, etc. While the same fundamental importance does not attach to such topics as dreams, illusions, hallucinations, suggestion, hypnotism, etc., the natural curiosity of most people in this class of subjects may serve as a source of vital interest and the arousal of problems which do lead into the heart of psychology. Most young people are very much interested in the learning processes and general intelligence of animals. The study of these I believe to be a very good introduction to the understanding of the learning processes of human beings and the most significant characteristics of human consciousness. In classroom discussions of relatively familiar topics without the use of a prescribed text-book, the way is prepared for the right use of the book as a means of enlarging and organizing psychological experiences felt to be inadequate and unsatisfactory, instead of using it as a substitute for experience. All the way through the subject, simple illustrations requiring analysis of the psychical elements involved should be sought and used abundantly. I refer to such material as the following: learning to swim, to

skate, to throw at a mark; the nature and function of the various mental activities involved in playing basketball, in boxing, foot-ball, etc.; the co-ordinations of sensory and motor processes involved in riding a bicycle and the process by which they are built up; the psychological basis of familiar proverbs and epigrams; what advertisements you remember and why; the psychology of the displays in show windows of the stores and of the headlines and cartoons of newspapers; the explanation of the different mental attitudes involved in being well-dressed or meanly clad; the kinds and effects of imagery in such poems as Longfellow's "The Village Blacksmith" and Tennyson's "Blow, Bugle, Blow"; study of the differences in imagery in different classes of literature; differences in the memorizing of poetry and prose, with psychological explanation, etc., etc. The teaching of psychology in the high school may well be supplemented and vivified by the use of simple experiments. The teacher should choose kinds of experiments that can be performed with as little apparatus as possible. Many experiments can be performed without any special apparatus or with such as almost anybody can devise. Seashore's "Elementary Experiments in Psychology" and Witmer's "Analytic Psychology" in the hands of the teacher will furnish a reasonable number of such experiments from which to select, and the teacher once started on the right track can devise others equally as simple. Personally, I would give less attention in an elementary course than the experimentalists of our colleges are inclined to do to the experiments in the field of sensation and more to those in the fields of memory, attention, apperception, imagination, simple and fundamental cases of suggestion, the learning process (both motor and

mental), and other aspects of the higher psychical processes. In every phase of the subject of psychology, care should be taken to bring out the significance and function of the various conscious processes in the life and activities of the individual and to show the intimate interrelations and interplay of these conscious processes with one another.¹

The Future of the Subject.—Whether psychology will work its way into the curriculum of secondary schools as fully as is justified by its general value, is a question that will be determined by a variety of considerations. One of the most fundamental difficulties in the way is that of securing teachers who are sufficiently well trained in the content and who at the same time realize the essential need of adjusting the subject-matter and method to the interests of life, particularly those of the average boy and girl of high school age. This difficulty will be in part overcome by the growing demand for teachers of both high academic preparation and special professional training for high school work. With the growth of the tendency in the special departments of the colleges and universities to consider the psychological aspects of their work, there will also be a larger number of teachers trained in history, literature, and biology, who will be fairly well qualified to conduct a class in psychology in the smaller high schools which cannot employ a special teacher for the subject. Text-books especially adapted to the use of the high school are very difficult to find; but with the growth of interest in the subject of psychology in the high school this difficulty is likely to be met soon. The

¹ For illustrations of this, see the principle applied in Angell's "Psychology," Dewey's "How We Think," or Miller's "Psychology of Thinking."

pressure of vocational studies for admission to the high school curriculum is likely in many places to occupy the attention of school officials so fully as to exclude interest in the claims of psychology. With the growth of vocational work in the high school there will be created a situation, however, that will call more imperiously for the inclusion of psychology in the curriculum, first because of its practical value in relation to the affairs of life which this very vocational demand creates, and second, because the high school will contain an even larger number of pupils proportionately who are not going to college, where this particular need would be satisfied.

In conclusion, we may say that while this discussion appears to be a plea for the fuller introduction of psychology into the curriculum of the high school, the writer would not like to be construed as an advocate of its indiscriminate and wholesale introduction into the secondary school curriculum. It better not be taught at all than to be conducted as a process of memorizing certain cut-and-dried principles and their applications to teaching, and this, possibly, from a text-book that is inaccurate and out of date.

CHAPTER XXVI

THE HIGH SCHOOL LIBRARY

THEODORE W. KOCH, A.M.

HEAD LIBRARIAN, UNIVERSITY OF MICHIGAN

Importance of Problem.—"There is no problem relating to the equipment of the high school which is more pressing than that of the library," said a recent editorial writer in the *School Review*. At the annual meeting of the New York State Library Association, in 1907, Dr. Downing, State Commissioner of Education, suggested that some special study be given to the question of high school libraries and a committee was later appointed to make an investigation of library conditions in high schools and report at the annual meeting in September, 1909. A questionnaire was sent to some eighty-three schools, but only a few of the replies contained more than the briefest answers. Twenty-five out of the fifty-two libraries heard from were in charge of librarians who had some library experience or training. Most of the librarians had been appointed to high school positions since 1903. The first appointment of a high school librarian in New York City was in 1900. The investigation as a whole was unsatisfactory, inasmuch as the high schools reporting were not representative of conditions throughout the State, much less throughout the country generally, and because the replies left much unsaid as to the actual use of and interest in these libraries.

In a discussion of "The difficulty of the high school library,"¹ Mr. Edwin White Gaillard, supervisor of work with schools, New York Public Library, claims that the problem is largely one of money and deprecates the duplication of work already being done by the public library. This is no more of an argument against high school libraries than are similar objections against departmental libraries in a university. The high school library is for a special kind of work—work that can best be done in the school building, under the supervision and guidance of one familiar with the special needs of the student. Mr. Gaillard grants that much, of course, may be learned about libraries and library methods in the high school library, but claims that the library habit, the habit of going to the public library for all sorts of information, of little or of great interest, cannot be acquired from the high school library. This is a point which I cannot concede. University librarians are familiar with a similar argument against technical departmental libraries to the effect that they have a tendency to make the technical student feel that there is no need of his going to the University Library, that the departmental library answers all his needs. Experience, however, proves that to have these students use any library you must plant it right in their midst. So with the high school students: give them a good library in their own school building and then see that they use it properly, for this is a part of modern education.

In these days when high schools are extending their work in so many directions and when books must be provided for supplementary work in English, in history, in the preparation of debates, and in other subjects, a

¹ *School Review*, April, 1907, vol. XV, pp. 245-250.

well-equipped library is a necessity in the modern high school. A motley array of old text-books, out-of-date encyclopædias and miscellaneous volumes from the attics of well-meaning friends of the institution will not make a good high school library. Upon how many school libraries in this country can former pupils look back as did Burne-Jones upon the little school library at Birmingham, as "that blessed institution where we spent many blissful hours"? The failure of many school libraries is due to a lack of proper care and fostering attention after they have been established. The library is there out of deference to a growing public sentiment in favor of such an annex, but the library is too frequently left to run itself, or the responsibility for its care is given to some teacher already overburdened with class-room work. The responsibility ought never to be placed on the teachers, or at least not on one who is doing full work as a teacher. The average teacher, if given charge of a school library, will confine her efforts to seeing that the rules are obeyed, that books are brought in on time, and that silence and order are preserved. She will not have time or energy to devote to the building up of the library, to instruct the pupils in its use, to look after reference work with the students, nor to help the teachers in finding needed material. "Disabuse yourselves of the notion that it is teachers' work, and a way out of the difficulty will be found," says a recent writer in the *Library Journal*.¹

The school library differs from the average public library in that it is usually a reference library first and a lending library only so far as the use of its books outside the building does not conflict with the usefulness of its service to the teachers and pupils in the school building.

¹ Vol. XXXIII, p. 136.

Duties of the Librarian.—The first duty of the librarian is to make the books, photographs, and other possessions of the library available by a simple and acceptable system of classification and cataloguing. After this has been accomplished it will be necessary to make these possessions known to the teachers and pupils. This can only be done by one who is familiar with the material and trained in its use. If the reference work is done by an untrained worker it is a case of the blind leading the blind. A teacher with no training in library methods will not go to another teacher, known to be similarly deficient, for information in regard to books, and the pupils will get comparatively little real library help from one who is primarily a class-room teacher, untrained to meet all classes of readers and answer a great variety of questions.

The interested librarian will be on the lookout for any new books that may be of use to teachers and pupils; she will try to keep a balance in the matter of books for the various departments of study, to inform herself on current events and, in short, make herself as useful in all lines of high school work as is possible with the time and means at her disposal.

Assistance for the Librarian.—As the work of the library grows it will be necessary for the librarian to have assistance of some kind. The arrangement for this will depend largely upon the circumstances in the given school. In many schools student assistants are employed. In some cases boys are hired at a small sum per hour to give their services as pages. In others good students are allowed to volunteer for library work, giving one hour a day to it. They enjoy the work and find their enlarged knowledge of the library very useful. In some schools

the librarian is assisted by a member of the teaching staff, who thus becomes familiar with the library and acquires some knowledge of reference work and can assist the pupils in various ways.

Purposes of a Library.—The purposes of a school library should be not only to provide laboratory material for the pupils' work in literature and history, to enable the teacher to instruct them in the use of books as sources of information, and to assist the teacher in other ways, but also to instil in the pupils an interest in books as books, to cultivate a taste for reading. Too many high school graduates have no conception of a book, other than fiction, as anything but a task or a text.

The high school library should not try to compete with the public library if there is one in the same town. Literature for recreation pure and simple is better supplied by the public library, where it is available for those who are both below and above the high school age. But, on the other hand, if there is nothing to interest the students by its innate appeal, if everything in the school library suggests lessons, many of the students will view it with suspicion, and avoid it, unless sent there by the teachers.

Teaching the Use of the Library.—Most pupils when they enter the high school are ignorant of the use of the simplest and most common reference books. They do not know the difference between a table of contents and an index, and are so helpless in a library that their teachers hesitate to give them work outside their text-books. Even those who are best informed can be helped to the use of books which will be of the greatest assistance to them in the preparation of their daily lessons, essays, and debates.

Early in the school year the librarian ought to meet the new students and explain to them in the reading-

room the grouping of the books and the fundamental principles underlying the making of a dictionary card catalogue. The location of various classes of reference books should be pointed out, the differences between a dictionary and an encyclopædia explained, and the various types of both commented upon. The pupils should be shown how to use "Poole's Index" and the "Reader's Guide to Periodical Literature" and have the helpfulness of these aids clearly brought home to them by concrete illustrations in connection with some practical theme work or preparation for a debate. If this initial visit to the library is made the subject of a required paper in the English course the benefits are doubled. The pupils can be assigned problems of various kinds involving the intelligent use of tables of contents and indexes, and familiarizing themselves with a variety of reference books.¹ They can be asked to fill out a call slip from the reference in the card catalogue, take the volume to the delivery desk, have it charged out, return it, see it discharged and put back in its regular place on the shelves.

Library Instruction.—The library instruction, in order to be of real benefit to the pupils, should be made a part of the school curriculum and be given credit the same as other work. In most schools where it is given it is counted as a part of the English work. In the high schools of Michigan the time given to the library work varies from one to three exercises for each of the grades. The instruction is given in the form of lectures or informal talks, after which the pupils are required to work out

¹ For some problems of this sort, see "Modern American Library Economy," by John Cotton Dana, Part V, "The School Department, Section 2," "Course of Study for Normal School Pupils on the Use of a Library," by Marjory L. Gilson.

a set of problems on reference books. This work is done in the library under the supervision of the librarian. The completed exercises are in some schools handed in to the librarian and in others to the English teacher, but the credit is usually given the pupil by his English teacher. The talks are arranged to suit the work and needs of the different classes. Those for the ninth grade pupils ordinarily include instruction in the use of dictionaries, encyclopædias and atlases, and the use of the table of contents and indexes in reference books. The instruction for the tenth grade takes up the use of the card catalogue, magazine indexes, year-books, and special indexes. The upper classes may be given practice work in comparing the value of different reference books, in learning to get references from various sources not on the reference shelves, and in the use of some of the government publications.

Library Courses.—One of the best library courses of this kind is that conducted by the librarian of the Detroit Central High School, where the work is graded to correspond with the regular grading of the English courses in that school. The librarian has a graded series of library questions which are among the best illustrations of this kind of work for high school courses available in print. We give specimens from the various series as follows:

- I. 1. Consult the indexes of poems by Holmes, and give the pages on which you find the following: (a) Poem beginning, "Listen, young heroes! Your country is calling."
(b) Poem entitled, "Dorothy Q."
2. Between what streets in our city does 870 Lafayette Street come?
- II. 1. Look up the "Seven Wonders of the World" in two different books. Do not copy them. Name the books in which you found them.

2. In what work of literature does the "Old Man of the Sea" appear? In what reference book did you find it?
- III. 1. Find the allusion to "Field of the Cloth of Gold" in two different books. In what books did you find it?
2. Use the card catalogue and give a reference for the life of John Greenleaf Whittier.
- IV. 1. (a) Who was governor of Iowa in 1906? (b) Where was he born?
2. (a) Name two good recent encyclopædias. (b) Name two good older encyclopædias.
- V. 1. (a) What is the general index to Government publications? (b) How often is it published?
2. (a) What is the Congressional directory? (b) Examine it and name any one reference point which interested you. (c) What is the *Congressional Record*?
- VI. Name good reference books under the following heads: (a) Classical dictionary. (b) Gazetteer of the world. (c) Atlas of the world. (d) Year-book for current history.

There is an almost endless variety of questions which can be put to the students to bring out points in connection with reference books. They can be asked to name the various kinds of dictionaries in the library, to tell which is the latest issue, to look up the same word in each, and tell the differences noted in the treatment of the word in question. See whether they can define a gazetteer, a glossary, and a concordance. Ask them where they would go to find a picture of the human skeleton, or colored plates of coats of arms and flags of various nations. See whether the word copyright means anything to them.

"The position of a modern librarian in a high school," says Principal McAndrew,¹ of the Washington Irving High School, New York, "seems to me like that of a

¹ In an address before the library section of the National Education Association, Boston, July 5, 1910.

missionary in a heathen country. No one but a librarian can realize what an astounding amount of ignorance we high school teachers exhibit regarding the purpose and operation of a library. Time and again in my library experience I have observed teachers searching through reference books who were too poorly trained to look in the table of contents and too proud to ask for help." A frank confession from the teacher is good for the soul of both the teacher and the librarian. Certainly the classroom teacher must inform herself more thoroughly on the rudiments of library methods if she is to work in successful co-operation with the school librarian. Normal schools are now giving instruction in library economy. The Oregon Library Commission has published a broadside listing under forty-three heads, "Some things a teacher should know about books and libraries." The list has been reprinted by the Michigan State Library Commission with slight revision. As specimens the following may be cited:

1. What are the best cyclopedias?
2. What dictionaries are best for school use and how do they differ?
3. What books can you consult to find out whether certain subscription sets urged upon the district by agents have any value?
4. What is the best printed aid to the formation of a teacher's professional library?
5. Where will you find annual summaries of the books on education, with notes as to their value?
6. What U. S. public documents would be of value to you in your school work and how may they be obtained?
7. What are the best printed lists of books for children and how much will they cost?
8. What are the best graded lists of children's books?

9. Where can you get notes about children's books that will be of service in guiding the reading of the children in your grade?
10. What are the best books for reading aloud in your grade?
11. What are the best collections of poetry for children?
12. What books may be the best stepping-stones for the boy who is a slave to the "nickel library" habit?
13. What simple, accurate, scientific books will you give to the boys who are, or may become, interested in natural science; and what will you choose for those who wish to identify specimens of insects, of minerals and rocks, of birds, and of flowers?
14. If you do not know about these books how will you inform yourself?
15. What are some of the best biographies for children?
16. What are some of the good books of travel for use in geography work?
17. How can you find what magazine articles have been written about any subject, and how can you get these articles for the use of the debating society?
18. What are the best books for the debating society?
19. What are the best periodicals for children?
20. What are the provisions of the school library law in regard to district-school libraries?

Value of Library Instruction.—Such library instruction as has been described is of great help to teachers assigning work to pupils and of the greatest benefit to the pupils themselves. Without it, the librarian, teachers, and pupils are handicapped in their work and the library fails of its full usefulness. A knowledge of how to use a library will be of the greatest value to the student not only through his high school course, but even more so in college, if he goes that far, or in continuing his reading and self-culture through the means of the public library when he discontinues his academic career. To be able to use books effectively, to know where to find exact information when wanted, is a kind of knowledge

that comes from familiarity with reference books and the use of books as sources. Such an acquaintance with books is of infinitely more value in later life than knowing a few text-books from cover to cover. The place in which to lay the foundation for this proper and intimate acquaintance with books as tools is in the school library and the period is that of the high school age.

BIBLIOGRAPHY*

CHAPTER II

THE DISCIPLINARY BASIS OF COURSES OF STUDY

By reading the references below one may follow critically subsequent experimental investigations which will deal with the question from the school's point of view and in a school environment.

Angell, J. R.—"Doctrine of Formal Discipline in the Light of the Principles of General Psychology." *Educational Review*, June, 1908.

Bagley, W. C.—"Educative Process," chap. XIII. \$1.25, Macmillan.

Bair, J. H.—"The Practice Curve." Columbia University Contributions to Philosophy, Psychology and Education, vol. IX.

Colvin, S. S.—"Some Facts in Partial Justification of the So-called Dogma of Formal Discipline." Bulletin of University of Illinois, vol. VII, no. XXVI.

Colvin, S. S.—"The Learning Process." \$1.50, Macmillan.

Delabarre and Henderson.—Articles in *Education*, May, 1909.

Ebert and Neumann.—"Ueber einige Grundfragen der Psychologie der Ubungsphanomene im Bereiche des Gedachtnisses." *Arch. f. d. gesamte Psychol.*, vol. IV.

Fracker, G. C.—"The Transfer of Training in Memory." *Psychological Review*, Mon. Supplements, vol. IX, no. II.

Heck, W. H.—"Mental Discipline and Educational Values." Second edition, revised, 1911. \$1.00, Lane.

Henderson, E. N.—"Principles of Education." \$1.75, Macmillan.

James, William.—"Principles of Psychology," vol. I, p. 667. 2 vols., \$4.80, Holt.

Judd, C. H., and Pillsbury, W. B.—Articles in *Educational Review*, June, 1908.

*The authors have independently adopted systems of references to periodicals, some preferring to emphasize date of publication, others, number of pages, etc.

- O'Shea, M. V.—"Education as Adjustment," chaps. XIII and XIV. \$1.50, Longmans.
- Rietz and Shade.—"Correlation of Efficiency in Mathematics and Efficiency in Other Subjects." *Bulletin of University of Illinois*. Vol. VI, no. X.
- Ruediger, W. C.—"Principles of Education," chap. VI. \$1.25, Houghton.
- Scripture, E. W.—"The Education of Muscular Control and Power," "Studies Yale Psychological Laboratory," vol. II, pp. 105-144.
- Seashore and Jenner.—"Training the Voice by Aid of the Eye in Singing." *Journal of Educational Psychology*, June, 1910.
- Shorey, P.—"A Symposium on the Value of Humanistic, Particularly Classical Studies; the Classics and the New Education." *School Review*, Nov., 1910.
- Swift, E. J.—"Mind in the Making." \$1.50, Scribner.
- Thorndike, E. L.—"Principles of Teaching," chap. XV. \$1.25, Seiler.
- Thorndike and Woodward.—"Influence of Improvement in One Mental Function Upon the Efficiency of Other Mental Functions." *Psychological Review*, vol. VIII, pp. 247, 348, 553.
- Whipple, G. M.—"Effect of Practice upon the Range of Visual Attention and of Visual Apprehension." *Journal of Educational Psychology*, May, 1910.
- Winch, W. H.—"Accuracy in School Children. Does Improvement in Numerical Accuracy Transfer?" *Journal of Educational Psychology*, Dec., 1910.
- Winch, W. H.—"The Transfer of Improvement in Memory in School Children." *British Journal of Psychology*, vol. II, p. 284.

CHAPTER III

HISTORY OF SECONDARY CURRICULUMS SINCE THE RENAISSANCE

- Adams, G. B.—"Civilization During the Middle Ages." \$2.50, Scribner.
- Brown, E. E.—"The Making of Our Middle Schools." \$2.50, Longmans.

- Clarke, G.—“Education of Children at Rome.” Macmillan.
- Cubberley, E.—“Changing Conceptions of Education.” \$3.50, Houghton.
- Davidson, Thomas.—“Education of the Greek People.” \$1.50, Appleton.
- Davidson, Thomas.—“A History of Education.” \$1.00, Scribner.
- Davidson, Thomas.—“Rousseau and Education According to Nature.” \$1.00, Scribner.
- Farrar, F. W.—“Essays on a Liberal Education.” Macmillan.
- Farrington, F. E.—“Secondary Education in France.” \$2.50, Longmans.
- Klemm and Hughes.—“Progress of Education in the Nineteenth Century.” \$2.25, Bradley-Garretson Co.
- Laurie, S. S.—“History of Educational Opinion from the Renaissance.” \$1.50, Cambridge University Press.
- Laurie, S. S.—“Rise and Constitution of the Early Universities.” \$1.50, Appleton.
- Monroe, Paul.—“Text-Book in the History of Education.” \$1.90, Macmillan.
- Paulsen, F.—“German Education Past and Present.” \$1.25, Scribner.
- Russell, J. E.—“German Higher Schools.” \$2.50, Longmans.
- Walden, J. W. H.—“The Universities of Ancient Greece.” \$1.50, Scribner.
- Watson, Foster.—“The English Grammar School to 1660.” \$2.00, Cambridge University Press.
- West, A. F.—“Alcuin and the Rise of the Christian Schools.” \$1.00, Scribner.
- Woodward, W. H.—“Vittorino da Feltre and Other Humanistic Educators.” \$1.60, Cambridge University Press.
- Youmans, E. L.—“Culture Demanded by Modern Life.” \$2.00, Appleton.

CHAPTER IV

PRINCIPLES AND PLANS FOR REORGANIZING SECONDARY EDUCATION

- Boynton, F. D.—“A Six-Year High School Course.” *Educational Review*, 20 : 515-19, Dec., 1900.
- Brown, J. Stanley.—“Development of Secondary Schools According to the Proposed Plan.” *School Review*, 13 : 15-18, Jan., 1905.
- Brown, J. Stanley.—“Joliet Township High School.” *School Review*, 9 : 417-32, Sept., 1901.
- Brubacher, A. R.—“Some Readjustments in Secondary Education.” *Education*, 24 : 613-20, June, 1904.
- Bunker, Frank F.—“The Reorganization of the Schools of Berkeley—A Plan.” Pamphlet No. 2, Board of Education, Berkeley, Cal.
- City Club of New York.—“A Suggested Readjustment of the Years of the Public School.” Jacob W. Mack, Chairman, Committee on Schools.
- Commercial Club of Minneapolis.—“A Plan for the Rearrangement of the Public School System.” Proposed by the Educational Committee.
- DeGarmo, Charles.—“Principles of Secondary Education.” p. 20. \$3.00, Macmillan.
- Dewey, John.—“The High School of the Future.” *School Review*, 1903, p. 1. Discussion, pp. 17-22.
- Draper, A. S.—“Annual Report of Commissioner of Education of State of New York, 1908 and 1909.”
- Hall, G. Stanley.—“Adolescence.” \$7.50, Appleton.
- Hanus, P. H.—“Six-Year High School Program.” *Educational Review*, 25 : 455-63, May, 1903. Also in “Modern School,” pp. 99 ff.
- Harper, W. R.—“The High School of the Future.” *School Review*, 11 : 1-3, Jan., 1903.
- Hedgepeth, V. W. B.—“Six-Year High School Plan at Goshen, Indiana.” *School Review*, 13 : 19-23, Jan., 1905.
- Liddeke, F.—“Extension of the High School Course.” *School Review*, 12 : 635-47, Oct., 1904.

- Lyttle, E. W.—“Should the Twelve-Year Course of Study be equally divided between the Elementary School and the Secondary School?” *Proc. N. E. A.*, 1904, p. 428. Discussion, p. 436.
- Lyttle, E. W., *et al.*—“Report of the Committee on Six-Year Course of Study.” *Proc. N. E. A.*, 1908, p. 625.
- Morrison, G. B.—“Report of Committee on Equal Division of Twelve Years in Public Schools between the District and the High School.” *Proc. N. E. A.*, 1907, p. 705. See, also Reports in *Proc. N. E. A.* since 1907.
- Snedden, D. S.—“Six-Year High School Course.” *Educational Review*, pp. 525-29, Dec., 1903.
- Whitney, F. P.—“Differentiation of Courses in the Seventh and Eighth Grades.” *Educational Review*, pp. 127-34, Feb., 1911.

CHAPTER V

INSTRUCTION: ITS ORGANIZATION AND CONTROL

NOTE.—The material bearing on the general subject-matter of this chapter, to be found in the recent literature of secondary education, is very extensive. The following brief bibliography is merely intended to indicate the types of discussion. For detailed study, the student should consult the files of the *School Review*, and the *Proceedings of the National Education Association* (Department of Secondary Education), especially the fiftieth anniversary volume (1906). A considerable portion of the literature of vocational education relates to the reorganization of secondary instruction. Consult also the several bibliographies of education prepared by the United States Bureau of Education.

- Armstrong, J. E.—“The Advantages of Limited Sex Segregation in the High School.” *School Review*, 18 : 339-50.
- Bolton, F. E.—“The Preparation of High School Teachers: What They Receive and What They Should Receive.” *School Review*, 15 : 97-122.
- Book, W. F.—“The High School Teacher from the Pupil's Point of View.” *Pedagogical Seminar*, 12 : 239.
- Brooks, S. D.—“The Extension of High School Influence.” *Educational Review*, 29 : 433.

- Brown, E. E.—“The Making of Our Middle Schools.” \$3.00, Longmans.
- Chancellor, W. E.—“A Theory of Motives, Ideals, and Values in Education.” \$1.75, Houghton.
- Chancellor, W. E.—“Our Schools: Their Administration and Supervision,” chaps. IV, V, VI, VII, XI, XIV. \$1.50, Heath.
- DeGarmo, Charles.—“Principles of Secondary Education,” 3 vols. \$3.00, Macmillan.
- Dewey, J.—“Ethical Principles Underlying Education.” \$.25, University of Chicago Press.
- Dutton and Snedden.—“Administration of Public Education in the United States,” chaps. XI, XII, XIII, XX.
- Elliott, E. C., and others.—“The Education and Training of Secondary School Teachers.” Fourth Year Book, Nat. Soc. for Sci. Study of Ed., Chicago, 1905.
- Gunnison, W. B.—“Should the Entire Time of the High School Principal Be Given to Administration?” *Proc. N. E. A.*, 1905 : 452.
- Hall, G. S.—“The High School as the People’s College.” *Pedagogical Seminar*, 9 : 63.
- Hanus, P. H.—“A Modern School.” \$1.25, Macmillan.
- Hollister, H. A.—“High School Administration.” \$1.50, Heath.
- Jardon, D. S.—“The High School Course.” *Educational Review*, 36 : 372-76.
- Luckey, G. W. A.—“Professional Training of Secondary School Teachers in the United States.” N. Y. Teachers College, Columbia University Press, 1903.
- National Education Association.—“Report of the Committee of Seventeen on the Professional Preparation of High School Teachers.” *Proc. N. E. A.*, 1907 : 523-668.
- Nightingale, A. F.—“Rigid vs. Elastic Courses.” *School Review*, 6 : 301.
- O’Shea, M. V.—“Dynamic Factors in Education,” chaps. XIV, XV. \$1.25, Macmillan.
- Palmer, G. H.—“The Ideal Teacher.” \$.35, Houghton.
- Richardson, M. W.—“Making a High School Programme.” *School Review*, 17 : 449-66.
- Ruediger, W. M.—“Principles of Education,” chaps. III and IV. \$1.25, Houghton.

- Sachs, J.—"The Departmental Organization of Secondary Schools." *Education*, 27 : 484-96.
- Shorey, P.—"Discipline *vs.* Dissipation in Secondary Education." *School Review*, 5 : 217.
- Tetlow, J.—"The High School Principal, His Rights, Duties, and Opportunities." *Educational Review*, 17 : 227.
- Thorndike, E. L.—"A Neglected Aspect of the American High School." *Educational Review*, 33 : 245-55.
- Vest, E. J.—"Text-Books and Public Schools." *Education*, 21 : 27.
- Vincent, G. E.—"Social Mind and Education," pp. 91-113. \$1.25, Macmillan.
- Young, E. F.—"The Public High School." *School Review*, 18 : 73-83.

CHAPTER VI

MATHEMATICS

For high school libraries:

- Ball, W. W. R.—"Mathematical Recreations and Problems." \$2.25, Macmillan.
- Ball, W. W. R.—"Short Account of the History of Mathematics." \$3.25, Macmillan.
- Cajori, F.—"History of Elementary Mathematics." \$1.50, Macmillan.
- Chrystal, G.—"Algebra," vols. I and II. A. and C. Black, London.
- Smith, D. E.—"Teaching of Elementary Geometry." Ginn.
- Smith, D. E.—"The Teaching of Elementary Mathematics." \$1.00, Macmillan.
- Stamper, A. V. W.—"A History of the Teaching of Elementary Geometry." Teachers College.
- Tannery.—"Notions de Mathématique." Paris.
- Tropfke.—"Geschichte der Elementar Mathematik." Veit Co., Leipzig.
- Weber and Wellstein.—"Encyklopädie der Elementar-Mathematik," 3 vols. Teubner.
- Young, J. W. A.—"The Teaching of Mathematics." \$1.50, Longmans.
- Young, J. W. A.—"Mathematical Monographs." Longmans.

Young, J. W.—“Fundamental Concepts of Algebra and Geometry.”
 German, French, and English Elementary Text-Books, including
 those by Emile Borel.
School Science and Mathematics. \$2.00 per year, Chicago, Ill.

Additional references:

- Dintzl, E.—“Der mathematischen Unterricht an den Gymnasien.”
 Austria.
 Gutzmer.—“Die Tätigkeit der Unterrichtskommission.” Teubner.
 Höfler, Alois.—“Didaktik des mathematischen Unterrichts.”
 Teubner.
 Klein.—“Elementarmathematik vom höheren Standpunkte aus,” 2
 vols., Teubner; and numerous works on the teaching of
 mathematics (German).
 Simon, Max.—“Didaktik und Methodik des Rechnens und der
 Mathematik.”
 Tannery, Painlevé, Picard, *et al.*—“De la Méthode dans les
 Sciences.” Felix Alcan, Paris, 1909.

Lists of real problems in *School Science and Mathematics*.

Numerous articles in *School Science and Mathematics*, in the *Zeitschrift, für mathematischen und naturwissenschaftlichen Unterricht* and in *l'Enseignement Mathématique*.

Series published by Teubner under general title, “Abhandlungen über den mathematischen Unterricht in Deutschland.”

“Mathematics in the Elementary Schools of the United States,”
 Bulletin No. 13, 1911, United States Bureau of Education.

“Mathematics in the Public and Private Schools of the United States,” Bulletin No. 16, 1911, United States Bureau of Education.

CHAPTER VII

PHYSICS

Articles on the teaching of physics in high schools:

- Birdseye, C. F.—“The Work of the Higher Education Association.”
Science, 31, 721, 1910.
 Ferry, F. C. (as Secretary-Treasurer of the Committee).—“The
 National Conference Committee on Standards of Colleges

- and Secondary Schools." *Science*, 30, 590, 1909. An account of the fourth annual meeting of the committee in 1909, at Cambridge, Mass., contains the committee's definition of the secondary school unit. Contains also the names of the committee members as delegates from various educational associations.
- Guthe, K. E.—"Some Reforms Needed in the Teaching of Physics." *Science*, 31, 1, 1910. A discussion of the problems to be solved in the training of teachers in colleges and universities.
- Hall, E. H.—"The Teaching of Physics in the Secondary School." Part of the volume by A. Smith and E. H. Hall on "The Teaching of Chemistry and Physics in the Secondary School." \$1.50, Longmans.
- Hall, E. H.—"Relations of Colleges and Secondary Schools in Respect to Physics." *Science*, 30, 578, 1909. Gives an account of the development of the present definitions of the physics unit for the high school.
- Hall, E. H.—"The Teaching of Elementary Physics." *Science*, 32, 129, 1910. A statistical study of ideas and usages of many teachers (geographically well distributed) as to the teaching of physics in high schools.
- Mann, C. R.—"The Physics Teacher's Problem." *Science*, 29, 951, 1909.
- Mann, C. R.—"Physics Teaching in the Secondary Schools of America." *Science*, 30, 789, 1909.
- Mann, C. R.—"The Interpretation of the College Entrance Board's New Definition of the Requirement in Physics." *Educational Review*, 31, 1909.
- Mann, C. R.—"Physics and Education." *Science*, 32, 1, 1910.
- Millikan, R. A.—"Relation of High School and College Physics." Separate: Address Before the Eastern Association of Physics Teachers, Boston, Mass., 1908.
- Packard, J. C.—"High School Physics." *Education*, 30, 512, 1910.
- Shedd, J. C.—"The Teaching of Elementary Physics." *Science*, 32, 376, 1910. A discussion of Hall's paper in *Science*, 32, 129, 1910.
- Spencer, Herbert.—"Educational, Intellectual, Moral, and Physical," 1860-1. What knowledge is of most worth?

- Terry, H. L.—“Four Instruments of Confusion in Teaching Physics.” *Science*, 31, 731, 1910.
- Woodhull, J. F.—“What Specialization has Done for Physics Teaching.” *Science*, 31, 729, 1910.
- High School Teachers' Association, New York City.—“Articulation of High School and College.” Pamphlet, Nov., 1910.
- “The New Movement among Physics Teachers.” *School Science and Mathematics*, 8, 1908. Contains the North Central Association's definition of the unit in physics.
- “Definition of Requirements in Elementary Physics.” A statement concerning the appointment, by the College Entrance Examination Board, of a committee of six secondary school teachers of physics; the definition and syllabus of the course as drawn up by this committee and adopted by the board. *School Science and Mathematics*, 9, 572, 1909.

Books for reference:

- Cajori, F.—“A History of Physics.” \$1.60, Macmillan.
- Cox, J.—“Mechanics.” The University Press, Cambridge, Eng.
- Edser, E.—“Heat for Advanced Students.” \$1.00, Macmillan.
- Edser, E.—“Light for Students.” \$1.50, Macmillan.
- Hastings, Charles.—“Light.” \$2.00, Scribner.
- Kaye and Laby.—“Physical and Chemical Constants.” \$1.50, Longmans.
- Mach, E.—“Die Mechanik in ihrer Entwicklung historisch-kritisch dargestellt.” Brockhaus, Leipzig. Translated (The Science of Mechanics) by T. J. McCormack, Open Court Publishing Company.
- Mach, E.—“Die Principien der Warmelehre.” Barth, Leipzig.
- The science of Physics needs badly a series of works which shall do for its other subdivisions what these two books, last named, have done for their respective fields. The high school student should be encouraged especially to read those parts of Mach's “Mechanics” which deal with the achievements of Galileo and of Newton. I have already referred to the desirability of the teacher's reading the section on the economy of science.
- Poincaré and Vreeland.—“Maxwell's Theory and Wireless Telegraphy.” \$2.00, McGraw Publishing Co.
- Smithsonian Physical Tables.—The Smithsonian Institution.

- Thompson, S. P.—“Light Visible and Invisible.” \$1.50, Macmillan.
- Thompson, S. P.—“Elementary Lessons in Electricity and Magnetism.” \$1.40, Macmillan.
- Thomson, J. J.—“Electricity and Matter.” \$1.25, Scribner.
- Thomson, J. J.—“The Corpuscular Theory of Matter.” \$2.00, Scribner.
- Thomson, J. J.—“The Discharge of Electricity through Gases.” \$1.00, Scribner.
- Watson, W.—“A Text-Book of Physics.” \$3.50, Longmans.

CHAPTER VIII

CHEMISTRY

Articles on chemistry in high schools:

- Allen, Charles R.—“Conditions and Equipment in Secondary Schools.” *School Science and Mathematics*, 599-604, Sept., 1910.
- Allen, J. H.—“The Value of Chemistry as a High School Subject.” *School Science and Mathematics*, 721-31, 788-800, Nov., Dec., 1910.
- Baker, M. S.—“How Much Chemical Theory Shall be Taught in the High School and How Shall It be Presented?” *School Science and Mathematics*, 273-83, April, 1906.
- Blanchard, Arthur A.—“Elementary Chemistry Teaching as a Means of Developing the Power of Independent Scientific Reasoning.” *School Science and Mathematics*, 382-87, May, 1910.
- Bush, George C.—“The Value and Limitations of Quantitative Work in Physics and Chemistry.” In National Education Association. *Journal of Proceedings and Addresses*, 1907, pp. 684-86.
- Clarke, Frank W.—“A Report on the Teaching of Chemistry and Physics in the United States.” Washington, Government Printing Office, 1881. United States Bureau of Education. Circular of Information, 1880, No. 6. The above contains a list of text-books relating to chemistry and physics, pp. 157-66.

- Curtman, Louis J.—“A System for the Preparation of Qualitative Unknowns.” *School Science and Mathematics*, 513-17, June, 1910.
- Dennis, L. M., and others.—“What of Chemistry Shall Be Taught in the High School and How Shall It Be most Effectively Taught?” In New York (State) Associated Academic Principals, *Proceedings*, 1902, pp. 439-54.
- Dubois, N. A.—“Practical Technical Chemistry in Our Schools.” *School Science and Mathematics*, 294-99, April, 1910. Read before the Chemical Section of the Central Association of Science and Mathematics Teachers in Chicago, Nov. 26, 1909.
- Geer, William C.—“The Teaching of Chemistry in the Secondary Schools: A Study of Recent Practice and Results.” In New York State Science Teachers' Association, *Proceedings*, 1905, pp. 45-59. New York State Education Department. Secondary education. Bulletin No. 81. *School Review*, 275, April, 1906.
- Hutchins, E. B.—“How May Instruction in Elementary Chemistry Be Made More Efficient?” In Central Association of Science and Mathematics Teachers, *Proceedings*, 1908, pp. 56-64. Also in *School Science and Mathematics*, 252-60, Mar., 1909.
- James, Gwendoline.—“The Teaching of Physics and Chemistry in American Secondary Schools” (Northeastern Division of the United States). Oswestry, Woodall, Minshall, Thomas & Co., 1907.
- Mead, G. H.—“Science in the High School.” *School Review*, 237, April, 1906.
- New York (State) Education Department.—Advance Sheets of Syllabus for Secondary Schools, 1910. *Physical Science*. Albany, New York State Education Department, 1910. 51 pp. *Chemistry*, pp. 28-51.
- Peters, Fredus N.—“What and How Much in High School Chemistry?” *School Science and Mathematics*, 107-15, Feb., 1908.
- Richards, T. W.—“The Value of Investigation to the Teacher of Chemistry.” In New England Association of Chemistry Teachers, Report, 1909, pp. 18-34.
- Schock, E. P., and others.—“Symposium on the Purpose and Organization of Chemistry Teaching in Secondary Schools.” *School Science and Mathematics*, May to Nov., 1909.

- Smith, Albert L.—“Conditions under Which the Teacher of Chemistry in High Schools is Working.” *School Science and Mathematics*, 237-40, Mar., 1910.
- Smith, Alexander, and Hall, Edwin H.—“The Teaching of Chemistry and Physics in the Secondary Schools.” \$1.50, Longmans.
- Sohon, Michael D.—“Chemistry in Secondary Schools.” *Science*, 979-83, June 24, 1910.
- Sohon, Michael D.—“The First Course in Chemistry.” *School Science and Mathematics*, 605-11, Sept., 1910.
- Symposium on the Teaching of Chemistry to Beginning Students. *School Science*, 144-61, June, 1903.
- Talbot, H. P.—“The Outlook for a Better Correlation of Secondary School and College Instruction in Chemistry.” *Science*, 961-74, June 24, 1910.
- Wade, Frank B.—“The Purpose and Method of the Chemistry Course in the Public High School.” *School Science and Mathematics*, 299-303, April, 1910.
- Welter, J. L.—“Chemistry in the High School.” *Pennsylvania School Journal*, 338-40, Feb., 1908.
- Whitsit, Jesse E.—“High School Chemistry: The Content of the Course.” *Science*, 974-79, June 24, 1910.
- Woodhull, John F.—“Modern Trend of Physics and Chemistry Teaching.” New York, Educational Review Publishing Co., 1906, pp. 236-47. Reprinted from the *Educational Review*, New York, Mar., 1906. Also in Schoolmasters' Association of New York and Vicinity, Report, 1905-6, pp. 48-59.
- Woodhull, John F.—“Science for Culture.” *School Review*, 123, Feb., 1907.
- Woodhull, John F., and others.—“The Teaching of Physical Science.” *Teachers College Record*, 11 : 1, 1910.
- Works, G. A.—“A High School Course in Applied Chemistry.” *School Review*, 560, Oct., 1910.
- “College Entrance Examination Board, Document 44,” 1909.
- “Report of Committee of Nine, University of the State of New York.” *High School Bulletin*, No. 7, 1900.
- “Requirements in Chemistry for Entrance to Harvard College and the Lawrence Scientific School,” 1900.

Books for the high school library:

- Bailey, E. H. S.—“Text-Book of Sanitary and Applied Chemistry.” \$1.40, Macmillan.
- Chittenden, R. H.—“Studies in Physiological Chemistry.” \$4.00, Scribner.
- Dodd, M. E.—“Chemistry of the Household.” \$1.50, American School of Home Economics, Chicago, Ill.
- Duncan.—“Chemistry of Commerce.” Harper.
- Holleman.—“Organic Chemistry.” Wiley.
- King, F. H.—“The Soil.” \$1.50, Macmillan.
- Lassar-Cohn.—“Chemistry in Daily Life.” \$1.50, Lippincott.
- Mendeleeff.—“Principles of Chemistry.” 2 vols., \$10.00, Longmans.
- Olsen.—“Quantitative Chemical Analysis.” \$4.00, Van Nostrand Co.
- Philip, J. C.—“Romance of Modern Chemistry.” \$1.50, Lippincott.
- Richards and Elliott.—“Chemistry of Cooking and Cleansing.” \$1.00, Home Science Pub. Co.
- Richter and Smith.—“Organic Chemistry.” 2 vols., \$6.00, Blakiston.
- Thorp, F. H.—“Outlines of Industrial Chemistry.” \$3.75, Macmillan.
- Walker, J.—“Introduction to Physical Chemistry.” \$3.25, Macmillan.

A valuable list of publications for free distribution, including many on different phases of applied chemistry (foods, soils, fertilizers, etc.), can be obtained from the Secretary of Agriculture, Washington, D. C. Also a list of similar publications for sale at a nominal sum can be obtained from the Superintendent of Documents, Washington, D. C.

The list of reference books given could be indefinitely extended. The free use of reference books in all branches should be encouraged as much as possible.

CHAPTER IX

BIOLOGY

General works for the teacher:

- Coulter, J. M. and J. G., and Patterson, A. J.—“Practical Nature Study and Elementary Agriculture.” \$1.35, Appleton.
Ganong, W. F.—“The Teaching Botanist.” \$1.25, Macmillan.
Guyer, M. F.—“Animal Micrology.” \$1.75, University of Chicago.
Hodge, C. F.—“Nature Study and Life.” \$1.50, Ginn.
Lloyd, F. E., and Bigelow, M. A.—“The Teaching of Biology in the Secondary School.” \$1.50, Longmans.
Stevens, W. C.—“Plant Anatomy and Handbook of Microtechnic.” \$2.00, Blakiston.

School Science and Mathematics. Chicago, published monthly; eleven volumes now completed.

References for school library:

- Chapman, F. M.—“Handbook of North American Birds.” \$2.00, \$2.50, Appleton.
Coulter, J. M.; Barnes, C. R.; Cowles, H. C.—“A Textbook of Botany.” 3 vols., \$2.00 each, American Book Co.
Duggar, B. M.—“Plant Physiology with Special Reference to Plant Production.” Gives special attention to agriculture. \$1.60, Macmillan.
Harmer, S. F., and Shipley, A. E.—“The Cambridge Natural History.” 10 vols., \$32.50, Macmillan.
Hegner, R. W.—“An Introduction to Zoology.” Discusses American animals. \$1.90, Macmillan.
Hertwig, R. (Translation by J. S. Kingsley).—“A Manual of Zoology.” Comprehensive. Accentuates relations of animals to man. \$3.00, Holt.
Kellogg, V. L.—“American Insects.” \$5.00, Holt.
Lankester, E. R.—“A Treatise on Zoology.” Macmillan. Not yet completed; six volumes published.
Nature Library, The. 15 vols. \$4.00 each, Doubleday, Page. Some of the books in this series (“The Frog Book,” “The Moth Book,” “The Butterfly Book”) are excellent.

- Robinson, B. L., and Fernald, M. L.—“Gray’s New Manual of Botany.” \$2.50, American Book Co.
- Strassburger, E.; Noll, F.; Schenck, H.; Karsten, G. (Lang, W. H.).—“A Textbook of Botany.” \$4.00, Macmillan.
- Walter, H. E.—“Wild Birds in City Parks.” \$35, McClurg.
- Ward, H. B.—“Fresh-Water Biology.” *In press*. Comprehensive, with keys to all groups of American fresh-water animals and plants. Wiley.

High school texts:

- Bergen, J. Y., and Caldwell, O. W.—“Practical Botany.” \$1.30, Ginn.
- Bergen, J. Y., and Davis, B. M.—“Principles of Botany.” \$1.50, Ginn.
- Hunter, C. W.—“Essentials of Biology.” \$1.25, American Book Co. Presented in Problems.
- Jordan, D. S.; Kellogg, V. L., and Heath, H.—“Animal Studies.” \$1.25, Appleton.
- Linville, H. R., and Kelly, H. A.—“A Textbook in General Zoology.” \$1.50, Ginn.

Laboratory manuals:

- Pepoon, H. S.; Mitchell, W. R.; Maxwell, F. B.—“Studies of Plant Life.” \$.50, Heath.
- Sharpe, R. W.—“Laboratory Manual in Biology.” \$.75, American Book Co.
- Whitney, W.; Lucas, F. C.; Shinn, H. B., and Smallwood, M. E.—“A Guide for the Study of Animals.” \$.50, Heath.

CHAPTER X

PHYSIOGRAPHY

Teaching physiography in high schools:

- Brigham, A. P.—“Physical Geography in Secondary Schools.” *Proc. N. E. A.*, 1897.
- Bryce, James.—“Importance of Geography in Education.” *Jour. of Geog.*, vol. I, no. 4.
- Davis, W. M.—“Geographical Essays,” chaps. II, IV, VII, VIII, IX, XI, XII. \$2.75, Ginn.

- DeGarmo, Charles.—“Correlation of Studies.” *Educational Review*, May, 1893.
- Dryer, Charles. R.—“What is Geography?” *Jour. of Geog.*, Oct., 1905.
- Dryer, Charles R.—“The New Geography: Studies in Indiana Geography.” The Inland Pub. Co.
- Fenneman, N. M.—“Problems in the Teaching of Physical Geography in the High Schools.” *Jour. of Geog.*, Mar., 1909.
- Kelley, Leslie C.—“Physical Geography in Secondary Schools.” *Jour. of Geog.*, Jan., 1908.
- Marbut, C. F.—“A College Unit in Physical Geography.” *Jour. of Geog.*, May, 1909.
- Platt, Mary I.—“Physical Geography in High Schools.” *Jour. of Geog.*, Oct., 1904.
- Redway, J. W.—“The New Basis of Geography.” \$1.00, Macmillan.
- Salisbury, Rollin D.—“Physiography in the High School.” *Jour. of Geog.*, Nov., 1910.
- Stearns, Jane.—“A Physiography Laboratory.” *Jour. of Geog.*, Dec., 1909.
- Sutherland, W. J.—“The Teaching of Geography.” \$1.25, Scott, Foresman.
- Trotter, Spencer.—“The Social Function of Geography.” Fourth Year Book, Nat. Herbart Soc.

For high school libraries:

- Chamberlin and Salisbury.—“Geology.” \$12.00, Holt.
- Davis, W. M.—“Elementary Meteorology.” \$2.50, Ginn.
- Davis, W. M.—“Geographical Essays.” \$2.75, Ginn.
- Fairbanks, H. W.—“Practical Physiography.” Allyn and Bacon.
- Geikie, A.—“Outlines of Field Geology.” \$1.00, Macmillan.
- Gregory, Keller, and Bishop.—“Physical and Commercial Geography.” \$3.00, Ginn.
- Guyot, Arnold.—“The Earth and Man.” \$1.75, Scribner.
- Henry, A. J.—“Climatology of the United States.” U. S. Weather Bureau.
- Jordan, David Starr.—“Science Sketches.” \$1.50, McClurg.
- Le Conte, Jos.—“Compend of Geology.” \$1.20, American Book Co.
- Merrill, A. P.—“Rocks, Rock Weathering, and Soils.” \$4.00, Macmillan.

- Mill, Hugh R.—“The New International Geography.” \$3.50, Appleton.
- Mill, Hugh R.—“The Realm of Nature.” \$1.50, Scribner.
- Powell, J. W., and others.—“Physiography of the United States.” American Book Co.
- Roberts, R. D.—“The Earth’s History.” \$1.50, Scribner.
- Russell, I. C.—“Glaciers of North America.” \$1.75, Ginn.
- Russell I. C.—“Lakes of North America.” \$1.50, Ginn.
- Russell, I. C.—“Rivers of North America.” \$2.00, Putnam.
- Russell, I. C.—“North America.” \$2.50, Appleton.
- Salisbury, R. D.—“Physiography for High Schools.” \$1.50, Holt.
- Shaler, N. S.—“Aspects of the Earth.” \$2.50, Scribner.
- Shaler, N. S.—“Nature and Man in America.” \$1.50, Scribner.
- Shaler, N. S.—“Outlines of the Earth’s History.” \$1.75, Appleton.
- Tarr, R. S.—“Economic Geology.” \$3.50, Macmillan.
- Tarr, R. S.—“Elementary Geology.” \$1.40, Macmillan.
- Waldo, Frank.—“Elementary Meteorology.” \$1.50, American Book Co.
- Ward, R. deC.—“Practical Exercises in Meteorology.” \$1.12, Ginn.

CHAPTER XI

ENGLISH

- Aiken, W. E.—“The Study of English Literature.” *Education*, 26 : 36.
- Ashmun, M.—“The Study of the English Masterpieces.” *Education*, 27 : 628.
- Baldwin, C. S.—“The Value of the Office Hour in the Teaching of Rhetoric.” *Educational Review*, 8 : 290.
- Bates, Arlo.—“Talks on the Study of Literature.” \$1.50, Houghton.
- Blakely, G. S.—“Teachers’ Outlines for Studies in English.” \$50, American Book Co.
- Bleyer, W. G.—“The High School Course in English.” \$15, Bulletin of the University of Wisconsin.
- Bolenius, E. M.—“Oral Composition.” *Education*, 31 : 449.
- Carpenter, Baker, and Scott.—“The Teaching of English.” \$1.50, Longmans. Contains a full bibliography to 1903.

- Chubb, Percival.—"The Teaching of English." \$1.00, Macmillan.
- Cooper, L.—"On the Teaching of Written Composition." *Education*, 30 : 421.
- Cross, W. L.—"English in the Schools." *Education*, 28 : 537.
- Danton, G. H.—"Required Reading and Company." *Educational Review*, 41 : 510.
- Dole, C. A.—"The Use of the Model in English Composition." *Education*, 24 : 426.
- Dunbar, A. M.—"The Training of a Teacher of English." *Education*, 29 : 97.
- Durand, G. H.—"The Teaching of English in the Secondary Schools." *Education*, 28 : 15.
- Eliot, C. W.—"The Differentiation of the High School Course in English." *Education*, 31 : 639.
- Faunce, W. H. P.—"The Humanizing of Study." *School Review*, 16 : 492.
- Firkins, O. W.—"The Teaching of Literature." *Education*, 28 : 306.
- Foster, W. T.—"A Talk with Teachers of English." *Educational Review*, 31 : 198.
- Fulton, M. G.—"Defence of the Special Teacher of Composition." *Nation*, 86 : 463.
- Gardiner, J. H.—"Teaching English in the Schools." *Outlook*, 94 : 626.
- Hagarty, L. D.—"The Formation of Literary Taste." *Educational Review*, 33 : 402.
- Hinsdale, B. A.—"Teaching the Language Arts." \$1.00, Appleton.
- Hitchcock, A. M.—"Problems in the Teaching of Composition." Holt.
- Hitchcock, A. M.—"How to Study Fiction." Allyn and Bacon.
- Hitchcock, A. M.—"An Experiment in Correcting Compositions." *Educational Review*, 7 : 240.
- Hitchcock, A. M.—"Economy in Teaching Composition." *Education*, 24 : 348.
- Hopkins, E. M.—"Handbook of English." University of Kansas.
- Lewis, F. W.—"Qualifications of the English Teacher." *Education*, 23 : 15.
- Lewis, W. D.—"Teaching of English." *Outlook*, 94 : 631.
- Libby, W.—"Forms of High School Recitation." *Education*, 28 : 608.

- Maby, M. C.—“Æsthetic Appreciation of Literature in Secondary Schools.” *School Review*, 15 : 731.
- Maby, M. C.—“For the Love of It.” *Outlook*, 90 : 565.
- Marsh and Royster.—“Teachers’ Manual for the Study of English Classics.” Scott, Foresman.
- McDonald, J. W.—“The Plight of English in the American High School.” *Education*, 25 : 16.
- McMurry, C. A.—“Special Method in the Reading of Complete English Classics.” \$.75, Macmillan.
- Miller, R. D.—“Teaching of English.” *Nation*, 90 : 208.
- Miller, R. D.—“Power to Think Straight.” *Nation*, 91 : 333.
- Mumford, A. D.—“Aim of the High School Course in Composition.” *Education*, 28 : 608.
- Neilson, W. A.—“What the College Has a Right to Expect of the Schools in English.” *School Review*, 16 : 73.
- Palmer, G. H.—“Self-Cultivation in English.” \$.10, Crowell.
- Porter and Clarke.—“New Ideas in Teaching English Literature.” *Poet Lore*, 8 : 432; 9 : 585.
- Ratigan, W. P.—“A Study of First Year English in the Secondary School.” Bulletin of Marquette University, No. 4.
- Scott, F. N.—“A Brief Catechism on Text-Books in English.” *Educational Review*, 37 : 359.
- Scudder, H. E.—“The Educational Law of Reading and Writing.” *Atlantic*, 73 : 252.
- Shackford, M. H.—“On Teaching Elementary English.” *Educational Review*, 30 : 303.
- Sisson, E. O.—“The High School’s Cure of Souls.” *Educational Review*, 35 : 359.
- Stevens, W. L.—“Co-operation in English Teaching.” *Nation*, 86 : 303.
- Thomas, C. S.—“How to Teach the English Classics.” Houghton.
- Thurber, S.—“Five Axioms of English Composition Teaching.” *School Review*, 5 : 7.
- Trent, Hanson, and Brewster.—“An Introduction to the English Classics.” Ginn.
- Willock, J. H.—“Teaching of Elementary English.” *Education*, 31 : 11.
- Proceedings of the National Education Association.

- Proceedings of the North Central Association of Colleges and Secondary Schools.
 Course Books of High Schools, *e. g.*, Oak Park, Ill.; New Bedford, Mass.
 Syllabus for Secondary Schools, English, New York State Education Department, Albany.
 Catalogue of Music Publications of Celebrated Authors Whose Poems Have Been Set to Music. Ditson.
The English Journal.—The University of Chicago Press. Organ of the National Council of Teachers of English.

CHAPTER XII

PUBLIC SPEAKING AND VOICE TRAINING

For the teacher:

- Baker, G. P.—“Forms of Public Address.” \$1.25, Ginn.
 Bautain, M.—“The Art of Extempore Speaking.” \$1.50, Scribner.
 Beecher, H. W.—“Oratory.” \$.50, Scrantom, Wetmore.
 Brooks, P.—“Lectures on Preaching.” \$1.20, Dutton.
 Buckley, J. M.—“Extemporaneous Oratory.” \$1.50, Methuen.
 Corson, H.—“The Aims of Literary Study.” \$.75, Macmillan.
 Corson, H.—“The Voice and Spiritual Education.” \$.75, Macmillan.
 Curry, S. S.—“The Province of Expression.” \$2.00, Boston Expression Co.
 Curry, S. S.—“Vocal and Literary Interpretation of the Bible.” \$1.50, Macmillan.
 Curry, S. S.—“Mind and Voice.” \$1.50, Boston Expression Co.
 Higginson, T. W.—“Hints on Writing and Speech Making.” \$.50, Longmans.
 Hussey, M. S.—“Helps in Teaching Reading.” \$.75, Lothrop.
 Kleiser, Grenville.—“How to Speak in Public.” \$1.25, Funk and Wagnalls.
 Lawrence, E. G.—“Speech Making.” \$1.25, Barnes.
 Legouv  , E.—“Reading as a Fine Art.” \$.50, Penn.
 Matthews, B.—“Notes on Speech Making.” \$.50, Longmans.
 Matthews, Wm.—“Orators and Oratory.”

- Mills, W.—“Voice Production.” \$2.25, Lippincott.
 Ott, E. A.—“How to Use the Voice in Speaking and Reading.” \$1.25, Hinds, Noble.
 Ott, E. A.—“How to Gesture.” \$1.00, Hinds, Noble.
 Pearson, P. M.—Various articles in *Talent* for 1904, 1905, 1906, 1907. See especially June, 1904.
 Phillips, A. E.—“Effective Speaking.” \$1.50, Newton Co.
 Phillips, A. E.—“Natural Drills in Expression.” \$1.25, Newton Co.
 Scott, W. D.—“The Psychology of Public Speaking.” \$1.25, Pearson.
 Sears, L.—“The History of Oratory.” \$1.50, Scott.
 Sears, L.—“The Occasional Address.” \$1.25, Putnam.
 Shurter, E. D.—“Extempore Speaking.” \$.90, Ginn.
 Trueblood, T. C.—“Reports of National Speech Arts Association.” 1893-1911.

For the library:

- Blackstone, H. E.—“The Best American Orations of To-day.” \$1.25, Hinds, Noble.
 Bryan, W. J.—“The World's Famous Orations.” 10 vols., Funk and Wagnalls.
 Clark, S. H.—“Handbook of Best Readings.” \$1.25, Scribner.
 Clark and Blanchard.—“Practical Public Speaking.” \$1.00, Scribner.
 Cumnock, R. L.—“Choice Readings.” \$1.50, McClurg.
 Fulton and Trueblood.—“Patriotic Eloquence.” \$1.00, Scribner.
 Fulton and Trueblood.—“Choice Readings.” \$1.50, Ginn.
 Fulton and Trueblood.—“Standard Selections.” \$1.25, Ginn.
 Harding, S. B.—“Select Orations Illustrating American History.” \$1.25, Macmillan.
 Henley, W. E.—“Lyra Heroica.” \$1.25, Scribner.
 Knapp and French.—“The Speech for Special Occasions.” Macmillan.
 Pearson, P. M.—“Intercollegiate Debates.” \$1.50, Hinds, Noble.
 Pearson, P. M.—*The Speaker*, a quarterly magazine of the best current material for public reading. \$1.50 per year, Hinds, Noble.
 Reed, T. B.—“Modern Eloquence.” 10 vols., \$40.00, Morris.
 Ringwalt, R. C.—“Modern American Oratory.” \$1.00, Holt.

- Ringwalt, R. C.—“Briefs on Public Questions.” \$1.20, Longmans.
Shurter, E. D.—“Masterpieces of Modern Oratory.” \$1.00, Ginn.
Shurter, E. D.—“Representative College Orations.” \$1.25, Macmillan.
Shurter, E. D.—“American Oratory.” \$1.65, Southwest Pub. Co.
Shurter, E. D.—“Modern American Speaker.” \$1.25, Hinds, Noble.
The Public Speaking Review. \$1.50 a year, monthly, Swarthmore, Pa.
Wagner, L.—“Modern Political Orations.” \$1.00, Holt.
“Winning Orations, Prize Orations in the Inter-State Association.”
2 vols. \$2.50, Crane Co.
“Winning Speeches, Prize Orations in the Northern Oratorical League.” \$1.25, American Book Co.

Text-books:

- Baker and Huntington.—“Principles of Argumentation.” \$1.12, Ginn.
Eisenwein, J. Berg.—“How to Attract and Hold an Audience.” \$1.25, Hinds, Noble.
Foster, W. T.—“Argumentation and Debate.” \$1.25, Houghton.
Fulton and Trueblood.—“Essentials of Public Speaking for Secondary Schools.” \$1.00, Ginn.
Fulton and Trueblood.—“Practical Elements of Elocution for Advanced Pupils.” \$1.50, Ginn.
Laycock and Scales.—“Argumentation and Debate.” \$1.10, Macmillan.
MacEwan, E. J.—“Essentials of Argumentation.” \$1.12, Heath.
Pattee, G. K.—“Practical Argumentation.” \$1.10, Century Co.
Phillips, A. E.—“Effective Speaking.” \$1.50, Newton Co.
Shurter, E. D.—“Public Speaking.” \$.90, Allyn and Bacon.
Thomas, R. W.—“Argumentation and Debate.” \$1.25, American Book Co.

CHAPTER XIII

LATIN

The following list of books and journals contains only those which are believed to be the most valuable to the average teacher who reads only English. Limitations of space exclude many which are more valuable for special purposes or for some teachers. A somewhat longer list can be found on p. 197 of Bennett and Bristol's "Teaching of Latin and Greek." A full bibliography of the discussion on the place of the classics in education can be gleaned from the notes of Professor Shorey's chapter in Kelsey's "Latin and Greek in American Education." Every teacher should, as a matter of course, subscribe to one or more of the classical journals, and keep informed on new books from their book reviews.

Journals:

The Classical Journal. The University of Chicago Press.

The Classical Weekly. Teachers College, New York City.

Aims and methods:

Bennett and Bristol.—"The Teaching of Latin and Greek." \$1.50, Longmans.

Kelsey, F. W.—"Latin and Greek in American Education." \$1.50, Macmillan.

The language:

Bennett, C. E.—"The Latin Language." \$1.00, Allyn and Bacon.
Byrne, Lee.—"The Syntax of High School Latin." \$.75, The University of Chicago Press.

Lewis, C. T.—"Elementary Latin Dictionary." \$2.00, American Book Co.

Lewis and Short.—"Harper's Latin Dictionary." \$6.50, American Book Co.

Lodge, Gonzalez.—"The Vocabulary of High School Latin." \$1.50, Teachers College.

Lodge, Gonzalez.—"Gildersleeve's Latin Grammar." \$1.20, University Publishing Co. The best American grammar for reference; but the teacher should have several grammars.

White, J. T.—"English-Latin Lexicon." \$1.50, Ginn.

General reference:

Peck, H. T.—"Harper's Dictionary of Classical Literature and Antiquities." \$6.00 in one vol., \$7.00 in two, American Book Co.

Sandys, J. E.—"A Companion to Latin Studies." University Press, Cambridge.

History of literature:

Crutwell, C. T.—"History of Roman Literature." \$2.50, Scribner.

Duff, J. W.—"A Literary History of Rome." \$4.00, Scribner.

Mackail, J. W.—"Latin Literature." \$1.25, Scribner.

History:

Abbott, F. F.—"Roman Political Institutions." \$1.50, Ginn.

Bury, J. B.—"The Student's History of the Roman Empire." \$1.50, American Book Co.

How and Leigh.—"A History of Rome to the Death of Cæsar." \$2.00, Longmans.

Mommsen, Theodor.—"The History of Rome," 5 vols., \$10.00, Scribner; also in Everyman's Library, 4 vols., \$.35 each, Dutton.

Oman, C. W. C.—"Seven Roman Statesmen." Edward Arnold, London.

Pelham, Henry.—"Outlines of Roman History." \$1.75, Putnam.

Roman life:

Abbott, F. F.—"Society and Politics in Ancient Rome." \$1.25, Scribner.

Abbott, F. F.—"The Common People of Ancient Rome." \$1.50, Scribner.

Fowler, W. W.—"Social Life at Rome." \$2.25, Macmillan.

Johnston, H. W.—"The Private Life of the Romans." \$1.50, Scott, Foresman.

The city and forum:

Hülsem, Ch.—"The Roman Forum," translated by J. B. Carter, Stechert.

Lanciani, R.—“The Ruins and Excavations of Ancient Rome.” \$4.00, Houghton.

Platner, S. B.—“The Topography and Monuments of Ancient Rome.” \$3.00, Allyn and Bacon

Cæsar:

Fowler, W. W.—“Cæsar,” in “Heroes of the Nations Series.” \$1.50, Putnam.

Holmes, T. R.—“Cæsar’s Conquest of Gaul.” \$7.75, The Clarendon Press.

Holmes, T. R.—“Translation of Cæsar’s Commentaries on the Gallic War.” \$1.40, Macmillan.

Cicero:

Boissier, G.—“Cicero and His Friends.” \$1.75, Putnam.

Forsyth, W. Q. C.—“Life of Marcus Tullius Cicero.” \$2.50, Scribner.

Virgil:

Ballard, H. H.—“The Æneid of Virgil,” translated into English verse. \$6.00, Scribner.

Boissier, G.—“The Country of Horace and Virgil.” \$1.75, Putnam.

Conington, John.—“Virgil,” 3 vols., the second containing the first six books of the Æneid. George Bell and Sons, London.

Conington, John.—“The Æneid of Virgil,” translated into English prose. \$2.25, Macmillan.

Fairbanks, Arthur.—“The Mythology of Greece and Rome.” \$1.50, Appleton.

Glover, T. R.—“Studies in Virgil.” \$2.25, Edward Arnold, London.

Sellar, W. Y.—“Virgil.” \$2.25, The Clarendon Press.

Williams, T. C.—“The Æneid of Virgil,” translated. \$1.50, Houghton.

Maps and illustrations:

Kiepert, H.—“Atlas Antiquus.” \$3.00, Rand, McNally.

Kiepert, H.—“Wall Maps.” Rand, McNally.

Schreiber, Th.—“Atlas of Classical Antiquities.” \$6.50, Macmillan.

Schreiber, Th.—“Atlas of Ancient and Classical Geography,” in “Everyman’s Library,” 27 maps, with index. \$.35, Dutton.

Photographs may be obtained from Fratelli Alinari, 137 Via del Corso, Rome, Italy, or D. Anderson, 85 Piazza di Spagna, Rome, Italy.

Slides may be obtained from Levy & ses Fils, 44, Rue Letellier, 44. Paris XVe.

Casts may be obtained from P. P. Caproni and Bro., 1914 Washington Street, Boston.

CHAPTER XIV

MODERN LANGUAGES

Journals:

Modern Language Notes, Baltimore; articles on research more than on methods; good reviews.

Modern Language Teaching, London W., organ of the English Modern Language Association; much on methods.

Die neuen Sprachen.

Le maître phonétique.

Les Langues modernes.

Bolletina di filologia moderna.

Monatshefte für deutsche Sprache und Pädagogik, Milwaukee.

Publications of the American Modern Language Association, Cambridge.

Methods:

Bahlsen, L.—“The Teaching of Modern Languages.” \$.50, Ginn.

Baumann, F.—“Reform und Anti-Reform im neusprachlichen Unterricht.” Berlin, 1902.

Bierbaum.—“Die analytischdirekte Methode des neusprachlichen Unterrichts.” Cassel.

Brebner.—“The Method of Teaching Modern Languages in Germany.” Macmillan.

Breul.—“The Teaching of Modern Foreign Languages in Secondary Schools.” \$.60, Macmillan.

Breymann.—“Die neusprachliche Reform-Litteratur.” Leipzig.

- Collard.—“La méthode directe dans l'enseignement des langues vivantes.” Bruxelles.
- Gouin, F.—“The Art of Teaching and Studying Languages.” \$2.75, Longmans.
- Heness, G.—*Der neue Leitfaden, beim Unterricht in der deutschen Sprache.* \$1.20, Holt.
- Jespersen, O.—“How to Teach a Foreign Language,” translated by Sophia Yhlen-Olsen. \$.90, Macmillan.
- Sauveur.—“Introduction to the Teaching of Living Languages.” \$.25, Jenkins.
- Special Reports of the Educational Department of Great Britain, vol. III.
- Viëtor.—“Die Methodik des neusprachlichen Unterrichts.” Leipzig.
- Viëtor.—“Der Sprachunterricht muss umkehren.” Heilbronn.
- Waetzold.—“Die Aufgabe des neusprachlichen Unterrichts und die Vorbildung der Lehrer.” Berlin.
- Walter, M.—“Die Reform des neusprachlichen Unterrichts auf Schule und Universität.” Marburg.

Courses:

- “Report of the Committee on College Entrance Requirements of the National Education Association,” 1899.
- “Report of the Committee of Twelve of the American Modern Language Association,” contained in the preceding, and issued separately by the United States Bureau of Education as chap. XXVI of the Commissioner’s Report for 1899.
- “Report of the Commission on Accredited Schools and Colleges of the Association of Colleges and Secondary Schools of the North Central States,” 1908, Chicago (from the secretary of the association).
- “Report of a Committee of Nine of the Wisconsin Teachers’ Association,” 1905, by A. R. Hohlfield, Madison.

The first three of these present graded lists of texts suggested for reading, with outlines of the kind and amount of work to be undertaken in each grade.

For the use of the German department:

- “A History of Germany.” Kohlrausch, Lewis, Bayard Taylor, or Sime.

- Curme's "Grammar of the German Language." \$3.50, Macmillan.
 Duden's "Orthographisches Wörterbuch."
 Hempl's "German Orthography." \$2.00, Ginn.
 Köhler's "Wörterbuch" or, if it can be obtained, Muret-Sanders
 "Wörterbuch."
 Könnecke's Bilderatlas zur deutschen Litteraturgeschichte.
 Sweet's "Primer of Phonetics."
 Thomas' "German Grammar" (\$1.50, Holt) and several other
 school grammars than the one used in instruction.
 Viëtor's "Die Aussprache des Schriftdeutschen."
 An atlas of Germany, as Andree, or Kiepert.
 A wall map of Germany (a good one published by Rand, McNally).
 Two histories of German literature, one illustrated, Vogt and Koch,
 or König, and at least one other: Scherer, Priest, Hosmer,
 Francke, or Robertson.
 Two or three German illustrated journals, as *Ueber Land und Meer*,
Die Kunst für Alle, *Die Gartenlaube*, Velhagen und Klasing's
Deutsche Monatshefte.
 A German-American newspaper, as *Die Illinois Staatszeitung*,
 Chicago, or *Die New Yorker Staatszeitung*, New York City.

For the use of the French department:

- Bellogs' French-English Dictionary. \$1.00, Holt.
 Bevier.—French Grammar. \$1.00, Holt.
 Clédat.—Grammaire raisonnée. Jenkins.
 Doumic.—Histoire de la littérature française. Stechert.
 Duruy.—History of France. Hachette.
 Edgren and Burnett's French-English Dictionary. \$1.50, Holt.
 Larousse.—Petit Dictionnaire. All French.
 Passy.—Les Sons du Français. Jenkins.
 Passy and Rambaud.—"Chrestomathie": a good collection of selec-
 tions from French literature.
 Van Laun.—History of French Literature.
 Map of France. Johnson.

Stereopticons, reflectoscopes, slides, etc.:

- A. H. Thompson & Co., Boston, Mass.
 Bausch & Lomb Optical Co., Rochester, N. Y.

McIntosh Stereopticon Co., Chicago.

T. H. McAllister, 49 Nassau Street, New York City.

Foreign books, maps, etc.:

G. E. Stechert & Co., 151 West 25th Street, New York.

Carl Schönhof, 128 Tremont Street, Boston.

W. R. Jenkins, for French books.

Gustav Fock, Leipzig.

F. A. Brockhaus, Leipzig.

Rand, McNally & Co., Chicago and New York (maps only).

Em. Terquem, Paris.

Picard et fils, Paris.

Song books:

Tonger's "Taschen-Album," Band 1: "100 Volkslieder für mittlere Stimme."

"Gaudeamus, 200 ausgewählte Volks u. Kommerzlieder."

"Deutsches Liederbuch für amerikanische Studenten." \$.75, Heath.

CHAPTER XV

HISTORY

FOR THE LIBRARY:

The following lists of books for supplementary reading are intended to be suggestive only, and by no means contain all the titles in the fields of history, civil government, and economics that it is desirable for a high school library to have. Nevertheless, it will be of very much more avail to a school to have many copies of most of the books named than to have a longer list and but one book of each kind.

Ancient history:

Abbott, F. F.—"Short History of Rome." \$1.00, Scott, Foresman.

Baikie, J.—"The Story of the Pharaohs." \$2.50, Macmillan.

Bury, J. B.—"History of Greece." \$1.90, Macmillan.

Capps, E.—"Homer to Theocritus." \$1.50, Scribner.

- Church, A. J.—"Roman Life in the Days of Cicero." \$.75, Dodd, Mead.
- Davis, W. S.—"Outlines of Roman Empire." \$.65, Macmillan.
- Day, E.—"Social Life of the Hebrews." \$ 1.25, Scribner.
- Emerton, E.—"Introduction to the Middle Ages." \$ 1.12, Ginn.
- Fling, F. M.—"Source Book of Greek History." \$ 1.00, Heath.
- Fowler, W. W.—"Julius Cæsar." \$ 1.50, Putnam.
- Guerber, H. A.—"Myths of Greece and Rome." \$ 1.50, American Book Co.
- Homer.—"Iliad," translated by Lang, Leaf, and Myers. \$.80, Macmillan.
- Homer.—"Odyssey," translated by Butcher and Lang. \$.80, Macmillan.
- How, W. W., and Leigh, H. D.—"History of Rome to the Death of Cæsar." \$ 2.00, Longmans.
- Jones, H. S.—"Roman Empire, B.C. 29 to A.D. 476." \$ 1.50, Putnam.
- Mahaffy, J. P.—"Alexander's Empire." \$ 1.50, Putnam.
- Maspéro, G.—"Life in Ancient Egypt and Assyria." \$ 1.50, Appleton.
- Munro, D. C.—"Source Book of Roman History." \$ 1.00, Heath.
- Oman, C. W. C.—"Seven Roman Statesmen of the Later Republic." \$ 1.60, Longmans.
- Plutarch.—"Lives," the so-called Dryden translation, revised by Clough. \$ 2.00, Little, Brown.
- Seignobos, C.—"History of Ancient Civilization." \$ 1.25, Scribner.
- Sophocles.—"Works." (Everyman's Library.) \$.35, Dutton.
- Tucker, T. G.—"Life in Ancient Athens." \$ 1.25, Macmillan.
- Wheeler, B. I.—"Alexander the Great." \$ 1.50, Putnam.

Mediæval and modern history:

- Adams, G. B.—"Civilization During the Middle Ages." \$ 2.50, Scribner.
- Archer, T. A., and Kingsford, C. L.—"The Crusades." \$ 1.60, Holt.
- Barry, W.—"Papal Monarchy." \$ 1.35, Putnam.
- Bémont, C., and Monod, G.—"Medieval Europe, 395-1270." \$ 1.60, Holt.
- Day, C.—"History of Commerce." \$ 2.00, Longmans.
- Eginhard.—"Life of Charlemagne." \$.30, American Book Co.
- Fournier, A.—"Napoleon the First." \$ 2.00, Holt.

- Gardiner, S. R.—"The Thirty Years' War." \$1.00, Scribner.
 Hazen, C. D.—"Europe Since 1815." \$3.00, Holt.
 Henderson, E. F.—"A Short History of Germany." \$4.00, Macmillan.
 Johnson, A. H.—"The Normans in Europe." \$1.00, Scribner.
 Lane-Poole, S.—"The Speeches and Table Talk of the Prophet Mohammed." \$1.00, Macmillan.
 Lowell, E. J.—"Eve of the French Revolution." \$2.00, Houghton.
 Mathews, S.—"The French Revolution." \$1.25, Longmans.
 Motley, J. L.—"Peter the Great." \$25, Maynard.
 Munro, D. C.—"History of the Middle Ages." \$90, Appleton.
 Munro, D. C., and Sellery, G. C.—"Medieval Civilization." \$1.25, Century Co.
 Ploetz, C.—"Epitome of Universal History." \$3.00, Houghton.
 Robinson, J. H.—"History of Western Europe." \$1.60, Ginn.
 Robinson, J. H.—"Readings in European History," abridged. \$1.50, Ginn.
 Robinson, J. H., and Beard, C. A.—"Development of Modern Europe," vol. I, \$1.50; vol. II, \$1.60, Ginn.
 Rose, J. H.—"Revolutionary and Napoleonic Era, 1789-1815." \$1.25, Macmillan.
 Seignobos, C.—"History of Contemporary Civilization." \$1.25, Scribner.
 Shepherd, W. R.—"Historical Atlas." \$2.50, Holt.
 Skrine, F. H.—"Expansion of Russia." \$1.50, Macmillan.
 Thatcher, O. J., and McNeal, E. H.—"Source Book for Medieval History." \$1.85, Scribner.
 Wakeman, H. O.—"European History, 1598-1715." \$1.40, Macmillan.
 Walker, W.—"The Reformation." \$2.00, Scribner.

English history:

- Allen, F.—"Anglo-Saxon Britain." \$1.00, Young.
 Bateson, M.—"Medieval England." \$1.35, Putnam.
 Besant, W.—"The Story of King Alfred." \$35, Appleton.
 Cheyney, E. P.—"An Introduction to the Industrial and Social History of England." \$1.40, Macmillan.
 Cheyney, E. P.—"Readings in English History." \$1.80, Ginn.
 Creighton, M.—"The Age of Elizabeth." \$1.50, Longmans.

- Freeman, E. A.—"William the Conqueror." \$.75, Macmillan.
Gairdner, J.—"Houses of Lancaster and York." \$1.00, Scribner.
Gairdner, J.—"The English Church in the Sixteenth Century." \$2.00, Macmillan.
Gardiner, S. R.—"The First Two Stuarts and the Puritan Revolution, 1603-1660." \$1.00, Longmans.
Green, J. R.—"A Short History of the English People." \$1.20, American Book Co.
Green, Mrs. J. R.—"Henry the Second." \$.75, Macmillan.
Harrison, F.—"Oliver Cromwell." \$.75, Macmillan.
Ilbert, C.—"Parliament, Its History, Constitution and Practice." \$.75, Holt.
Jessopp, A.—"The Coming of the Friars." \$1.25, Putnam.
Lawless, E.—"The Story of Ireland." \$1.50, Putnam.
Montague, F. C.—"The Elements of English Constitutional History." \$1.25, Longmans.
Morley, J.—"Walpole." \$.75, Macmillan.
Oman, C. W. C.—"Warwick, the Kingmaker." \$.75, Macmillan.
Ransome, C.—"History of England." \$2.25, Macmillan.
Rosebery, Lord.—"Pitt." \$.75, Macmillan.
Russell, G. W. E.—"William Ewart Gladstone." \$1.00, Harper.
Scarth, H. M.—"Roman Britain." \$1.00, Young.
Stubbs, W.—"Early Plantagenets." \$1.00, Scribner.
Thursfield, J. R.—"Peel." \$.75, Macmillan.
Traill, H. D.—"William the Third." \$.75, Macmillan.
Woodward, W. H.—"Short History of the Expansion of the British Empire, 1500-1870." \$1.00, Macmillan.

United States history:

- Brigham, A. P.—"Geographic Influences in American History." \$1.50, Ginn.
Brown, W. G.—"Andrew Jackson." \$.65, Houghton.
Burton, T. E.—"John Sherman." \$1.25, Houghton.
Cambridge Modern History, vol. VII, "The United States." \$4.00, Macmillan.
Cheyney, E. P.—"European Background of American History." \$2.00, Harper.
Coman, K.—"Industrial History of the United States." \$1.60, Macmillan.

- Dodd, W. E.—"Statesmen of the Old South." \$1.50, Macmillan.
 Elson, H. W.—"History of the United States." \$1.75, Macmillan.
 Fiske, J.—"Beginnings of New England." \$2.00, Houghton.
 Fiske, J.—"Critical Period of American History, 1783-1789." \$2.00, Houghton.
 Fiske, J.—"Old Virginia and Her Neighbors." 2 vols., \$4.00, Houghton.
 Ford, P. L.—"The Many-Sided Franklin." \$3.00, Century Co.
 Harding, S. B.—"Select Orations Illustrating American History." \$1.25, Macmillan.
 Hart, A. B.—"Formation of the Union." \$1.25, Longmans.
 Hart, A. B.—"Source Book of American History." \$.60, Macmillan.
 Johnston, A.—"American Politics." \$.80, Holt.
 Lecky, W. E. H.—"American Revolution," edited by J. A. Woodburn. \$1.25, Appleton.
 Lodge, H. C.—"George Washington." 2 vols., \$2.50, Houghton.
 Lodge, H. C.—"Daniel Webster." \$1.25, Houghton.
 MacDonald, Wm.—"Documentary Source Book of American History." \$1.75, Macmillan.
 Morse, J. T., Jr.—"Abraham Lincoln." 2 vols., \$2.50, Houghton.
 Parkman, F.—"The Oregon Trail." \$.40, Ginn.
 Paxson, F. L.—"The Last American Frontier." \$1.50, Macmillan.
 Paxson, F. L.—"The Civil War." \$.75, Holt.
 Sparks, E. E.—"Men Who Made the Nation." \$2.00, Macmillan.
 Thwaites, R. G.—"Daniel Boone." \$1.00, Appleton.
 Thwaites, R. G.—"The Colonies." \$1.25, Longmans.
 Trent, W. P.—"Robert E. Lee." \$.75, Small, Maynard.
 Wilson, W.—"Division and Reunion." \$1.25, Longmans.
 Wilson, W.—"The State." \$2.00, Heath.
 Wister, O. E.—"Ulysses S. Grant." \$.75, Small, Maynard.

Civil government and economics (see "American history" for other titles):

- Baldwin, S. E.—"The American Judiciary." \$1.25, Century Co.
 Bryce, J.—"The American Commonwealth." 2 vols., \$4.00; abridged, 1 vol., \$1.75, Macmillan.
 Bullock, C. J.—"Introduction to the Study of Economics." \$1.25, Silver, Burdett.

- Bullock, C. J.—“Selected Readings in Economics.” \$2.25, Ginn.
- Commons, J. R.—“Trade Unionism and Labor Problems.” \$2.00, Ginn.
- Dewey, D. R.—“Financial History of the United States.” \$2.00, Longmans.
- Ely, R. T.—“Socialism and Social Reform.” \$1.50, Crowell.
- Fairlie, J. A.—“Local Government in Counties, Towns and Villages.” \$1.25, Century Co.
- Fairlie, J. A.—“The National Administration of the United States.” \$2.50, Macmillan.
- Fetter, F. A.—“Principles of Economics.” \$2.00, Century Co.
- Finley, J. H., and Sanderson, J. F.—“The American Executive.” \$1.25, Century Co.
- Fuller, R. H.—“Government by the People.” \$1.00, Macmillan.
- Goodnow, F. J.—“Municipal Problems.” \$1.50, Macmillan.
- Henderson, C. R.—“Dependents, Defectives, Delinquents.” \$1.50, Heath.
- Hinsdale, A. B.—“The American Government.” \$1.25, American Book Co.
- Ilbert, C.—“Parliament, Its History, Constitution and Practice.” \$.75, Holt.
- Johnson, E. R.—“Elements of Transportation.” \$1.50, Appleton.
- Macy, J.—“Party Organization and Machinery.” \$1.25, Century Co.
- Ostrogorski, J.—“Democracy and the Party System.” \$1.75, Macmillan.
- Plehn, C. C.—“Introduction to Public Finance.” \$1.75, Macmillan.
- Reinsch, P. S.—“American Legislature and Legislative Methods.” \$1.25, Century Co.
- Scott, W. A.—“Money and Banking.” \$2.00, Holt.
- Taussig, F. W.—“Tariff History of the United States.” \$1.25, Putnam.
- Taylor, H. C.—“Introduction to the Study of Agricultural Economics.” \$1.25, Macmillan.
- Wilcox, D. F.—“The American City.” \$1.25, Macmillan.
- Willoughby, W. F.—“Territories and Dependencies.” \$1.25, Century Co.

Wines, F. H., and Koren, J.—“The Liquor Problem.” \$1.25, Houghton.

Woodburn, J. A.—“The American Republic.” \$2.00, Putnam.

For the teacher:

Allen, J. W.—“The Place of History in Education.” A suggestive discussion of what is history and what its values are for students. Treats of content of the study rather than of method of teaching.

Barnes, Mary Sheldon. “Studies in Historical Method.” \$.90, Heath. The author was one of the leading advocates of the source method of teaching history, and here presents clearly the leading features of that plan.

Bourne, Henry E.—“The Teaching of History and Civics.” \$1.50, Longmans. Because of the wide scope of its treatment and its wealth of material and suggestion, this constitutes the most serviceable hand-book for the high school teacher of these subjects.

Hinsdale, B. A.—“How to Study and Teach History.” \$1.50, Appleton. When first issued, in 1893, this was one of the most useful books in this field. It is now somewhat superseded, yet still possesses serviceableness. Especially useful are the eight chapters devoted to the teaching of American history.

Johnson, Henry.—“The Problem of Adapting History to Children in the Elementary Schools.” The author brings sound pedagogical theory, thorough historical scholarship, and successful experience in teaching to the discussion of his subject, and his book is full of suggestiveness for teachers in the high school as well as for those in the grades.

Keatinge, M. W.—“Studies in the Teaching of History.” \$1.60, Macmillan. Though directed at English conditions, it has for the American teacher much that is very suggestive. The setting of problems in the teaching of history is strongly presented.

Mace, W. H.—“Method in History.” \$1.00, Ginn. Its contents are of varying value: not all are to be accepted, but much is very helpful.

- Vincent, John M.—“Historical Research. An Outline of Theory and Practice.” This for high school teachers is the best presentation in English of the modern historical method. It gives a comprehensive treatment of the subject, dealing with the various sorts of source material, with the critical interpretation of historical evidence and the construction of the historical narrative.
- “The Study of History in Schools.” A Report to the American Historical Association by a Committee of Seven. An indispensable book for the prospective teacher as during the last decade it has been the greatest single influence in shaping text-books, courses of study, methods, and ideals of history teaching in the high school.
- “The Study of History in the Secondary Schools.” A Report to the American Historical Association by a Committee of Five. This committee was appointed ten years after the appointment of the Committee of Seven, to consider the recommendations of that committee, and to determine how far they should be modified. It constitutes a valuable supplement to the earlier report, and should be used in connection with it.
- “Report of the Committee of Five of the American Political Science Association on Instruction in American Government in Secondary Schools,” in the Proceedings of the Association, 1908, vol. V, pp. 219-57. This contains a careful consideration of the status of civics teaching, and presents recommendations as to the course of study, methods of teaching, preparation of teachers, the text-book, and the books for supplementary reading. Both the origin and contents of this Report make it a very important source of material for the teachers of civics.
- “History Syllabus for Secondary Schools.” “Historical Sources in Schools.” “American Civil Government. An Outline Study for Secondary Schools.” These are the reports of three committees of the New England History Teachers’ Association. The first is a comprehensive list of topics and references in ancient, mediæval, modern, English, and American history, and all are of great service both to the high school student and to the teacher. Each volume gives much advice and helpful direction as to the use of the carefully selected references which it contains.

- Andrews, C. M.; Gambrill, J. M., and Tall, L. L.—“A Bibliography of History for Schools and Libraries.” \$.60, Longmans. A report of a committee of the History Teachers' Association of the Middle States and Maryland. Many of the books whose titles are given are critically estimated, so that it constitutes a very useful guide in determining what books are best adapted to the various requirements of collateral reading. This report is supplemented each year by the annual bibliography issued by the North Central History Teachers' Association.
- The American Historical Review.* This is obtained through membership in the American Historical Association which brings also the “Annual Report.” Both these are valuable for the critical reviews and special articles.
- The History Teachers' Magazine.* Published monthly during the school year since September, 1909, it has been of great value to its subscribers, and its files contain very much of worth for all teachers of history.

CHAPTER XVI

DRAWING, FREEHAND AND MECHANICAL

Miscellaneous:

- “American Education in Fine and Industrial Art.” U. S. Bureau of Education, 1885.
- “Art Education in the Public Schools of the United States,” edited by Dr. James P. Haney. *American Art Annual*, New York.
- “Industrial Drawing from the Standpoint of an Architect,” Frederick Law Olmsted, Jr. “Industrial Drawing from the Standpoint of a Manufacturer,” Milton P. Higgins. 68th Annual Report of the Massachusetts Board of Education, 1903-4, pp. 263-76.
- “Upon Teaching Design.” James Hall in “Year Book of the Council of Supervisors,” vol. 3, 1903.

FOR HIGH SCHOOL LIBRARIES:

Magazines:

- The International Studio.* Lane.

The School Arts Book. This is a monthly publication. School Arts Publishing Co., 120 Boylston St., Boston.
The Manual Training Magazine. Peoria, Ill.

Books:

- Batchelder, E.—“Principles of Design.” \$3.00, Inland Printer.
Bennett, Charles A.—“Problems in Mechanical Drawing.” \$1.00, Manual Arts Press.
Cadness, H.—“Decorative Brush Work and Elementary Design.” \$1.40, Scribner.
Caffin, C. H.—“American Masters of Painting.” \$1.25, Doubleday, Page.
Cross, A. K.—“Light and Shade.” \$1.00, Ginn.
Day, L. F.—“Nature: The Raw Material of Ornament.” \$2.00, Scribner.
Day, L. F.—“Ornament: The Finished Product of Nature.” \$3.00, Scribner.
Day, L. F.—“Nature in Ornament.” \$5.00, Scribner.
Day, L. F.—“Pattern Design.” \$3.00, Scribner.
Day, L. F.—“Ornament and Its Application.” \$3.25, Scribner.
Day, L. F.—“Alphabets Old and New.” \$1.25, Scribner.
Day, L. F.—“Lettering in Ornament.” \$2.00, Scribner.
Fergusson, J.—“Handbook of Architecture in All Ages.” Dodd, Mead.
Glazier, R.—“A Manual of Historic Ornament.” \$2.00, Scribner.
Haddon, A. C.—“Evolution of Art.” \$1.50, Scribner.
Harrison, B.—“Landscape Painting.” \$1.50, Scribner.
Jackson, F. G.—“Lessons on Decorative Design.” \$2.00, Scribner.
Jackson, F. G.—“Theory and Practice of Design.” \$2.50, Scribner.
Johnston, E.—“Writing, Illuminating and Lettering.” \$2.00, Macmillan.
Maginnis, C. D.—“Pen Drawing.” \$1.00, Bates and Guild.
Mathewson, Frank E.—“Notes for Mechanical Drawing.” \$1.25, Taylor-Holden Co.
Munsell, A. H.—“A Color Notation.” \$1.00, Geo. H. Ellis.
Reinach, S.—“Apollo.” \$1.50, Scribner.

CHAPTER XVII

MUSIC IN THE HIGH SCHOOL

1. Music in the high school:

For further information on what the high school should demand of the grammar schools, see "Report of Committee on Public Schools," by Ralph L. Baldwin, in *Proceedings Music Teachers' National Association*, 1908.

For musical work demanded of the high schools by the colleges, see "Condensed Report of High School Music Courses" in *Proceedings N. E. A.*, 1904, p. 702.

For further publications on entrance requirements and reports on experiments recognizing independent instrumental work of high school students in Brookline and Chelsea, see material edited by the New England League. Address Leo Rich Lewis, Tufts College, Mass.

For suggestions on conducting high school music, see "Music in High Schools," by O. McConathy, in *Proceedings N. E. A.*, 1908, p. 844, and "High School Courses; Appreciation Work," by E. B. Birge, in *Proceedings Music Teachers' National Association*, 1909, p. 142.

For practical suggestions for organizing and managing choruses, with a selected list of compositions, see "Syllabus for Secondary Schools, 1910, Music," New York State Educational Department, Albany.

For suggestions with reference to organizing instrumental clubs, write to A. G. Marshall, Maidstone Orchestral Association, Hatton House, Hatton Gardens, London, E. C. This English movement has reached half a million children and the plan of organization is worthy of study and application to American conditions.

For compositions suitable for school orchestras, see classical and popular lists published by Carl Fischer, Fourth Avenue, New York.

For suggestions with reference to player pianos, see lists prepared by Leo Rich Lewis, Tufts College, Massachusetts, and four publications of the Aeolian Co., Fifth Avenue, New York.

"The Pianola," by Henry J. Wood. "Twenty Musical Evenings," by Henry T. Finck. "The Pianolist," by Gustav Kobbé. "The Music Lovers' Library."

For suggestions as to how to awaken interest in instrumental music, see "Education through Music," chaps. XIV to XVII, inclusive, by Charles H. Farnsworth. \$1.00, American Book Co.

2. Books helpful for teachers and students are as follows:

Dictionaries:

Baker, Dr. Theodore.—"A Biographical Dictionary of Musicians." \$3.50, Schirmer.

Elson, Lewis C.—"Elson's Pocket Music Dictionary." \$35, Ditson. Should be owned by each student.

Grove, Sir George.—"Dictionary of Music and Musicians," 5 vols., Macmillan. A library in itself.

Riemann, Hugo.—"Dictionary of Music." \$4.50. English translation by J. S. Shedlock. An admirable one volume encyclopedia.

Histories:

Baltzell, W. J.—"A Complete History of Music." \$1.75, Schirmer. Includes some portraits and musical examples.

Dickinson, Edward.—"A Study of the History of Music." \$2.50, Scribner. A helpful guide for more exhaustive reading.

Hamilton, Clarence.—"Outlines of Musical History." \$1.50, Ditson. Helpful to those wishing to arrange a course of historical recitals.

Pratt, Waldo S.—"History of Music." \$3.00, Schirmer. An excellent arrangement of material expressed through the use of different types.

Theoretic and descriptive:

Broadhurst, John.—"Students' Handbook of Acoustics." Wm. Reeves, London. The phenomena of sound as connected with music.

Crowest, Frederick J.—"The Story of Notation." \$1.25, Scribner. Throws light on the complexities of our notation.

Elson, Arthur.—"Music Club Programs from All Nations." \$1.25, Ditson.

- Hadow, W. H.—“Sonata Form.” Paper, \$1.00; boards, \$1.25, Novello, Ewer.
- Hale, Philip.—“Boston Symphony Orchestra Book.”
- Lavignac, Albert.—“Music and Musicians.” Edited by H. E. Krehbiel. \$3.00, Holt. An excellent book of reference.
- Mason, Daniel Gregory.—“The Orchestra and Orchestral Music.” A popular treatment of the subject.
- Parry, C. H. H.—“The Evolution of the Art of Music.” \$1.75, Appleton. An account of the origin of music that every one should read.
- Riemann, Hugo.—“Catechism of Musical History,” part 2, \$1.00. A history of musical forms with biographical notices of most illustrious composers.

On appreciation:

- Dickinson, Edward.—“The Education of a Music Lover.” \$1.50, Scribner.
- Grove, Sir George.—“Beethoven and His Nine Symphonies.” \$2.40, Novello, Ewer.
- Henderson, W. H.—“What is Good Music?” \$1.00. Suggestive to persons desiring to cultivate a taste in musical art.
- Kobbé, Gustav.—“Ring of the Nibelung.” \$1.00, Schirmer. A brief descriptive analysis containing all the leading motives.
- Krehbiel, H. E.—“How to Listen to Music.” \$1.25, Scribner. A short and recent treatment of the appreciation of music.
- Lavignac, Albert.—“The Musical Dramas of Richard Wagner, and His Festival Theatre in Bayreuth.” \$2.50. Translated from the French by Esther Singleton.
- Mathews, W. S. B.—“How to Understand Music.” Vol. I, \$1.50, Presser. One of the oldest and best books on the appreciation of music.
- Surette and Mason.—“Appreciation of Music.” \$1.50, Novello, Ewer.
- Upton, George P.—“The Standard Operas.” \$1.50, McClurg.
- Upton, George P.—“The Standard Oratorios.” \$1.50, McClurg.
- Upton, George P.—“The Standard Symphonies.” \$1.50, McClurg.
- These three volumes by Upton are brief and clear statements of the subjects with which they deal.

CHAPTER XVIII

MORAL EDUCATION AND TRAINING

Care has been taken to include books that are comprehensive and suggestive in treatment. Those wishing a more extended bibliography are referred to *Religious Education*, vol. V, no. VI.

1. Books and monographs dealing with the larger aspects of the subject:

Adler, Felix.—“The Moral Education of Children.” \$1.50, Appleton. One of the best-known books, but of little value for its bearing on the subject in the high school.

Coe, George A.—“Education in Religion and Morals.” \$1.35, Revell. The emphasis is upon religion as including morals and upon “the wholeness of life, from which no human good can be excluded.”

DeGarmo, Charles.—“Principles of Secondary Instruction,” vol. III, “Ethical Training.” \$1.00, Macmillan. The most systematic treatment accessible in English. An attempt “to bring into clearer light the moral functions of knowledge,” with particular reference to the adolescent.

Dewey, John.—“Moral Principles in Education.” \$.35, Houghton. Emphasizes the importance of the moral training that comes from participation in the life of the school and from methods of instruction. Opposed to direct ethical instruction.

Griggs, Edward H.—“Moral Education.” \$2.00, Huebsch. As a whole, very general in treatment. Chaps. XVII–XXV deal more directly with the subject.

Hall, G. Stanley.—“Youth: Its Education, Regimen, and Hygiene.” \$1.50, Appleton. An epitome of the author’s larger work on adolescence. Chap. XII deals with moral and religious training.

Hart, Joseph K.—“A Critical Study of Current Theories of Moral Education.” \$.50, University of Chicago Press. A scholarly statement of the need of a reconstructed education which “will carry with it its own moral inspirations and sanctions.”

- Horne, Herman H.—“Idealism in Education.” \$1.25, Macmillan. The theme is “man-making.” While regarding men and women as products of heredity and environment, in chap. IV the author puts emphasis on will, through which man contributes to his own making.
- Ladd, G. T.—“The Philosophy of Conduct.” \$3.50, Scribner.
- Palmer, George H.—“Ethical and Moral Instruction in Schools.” \$.35, Houghton. Recognizes the need of ethical instruction and sees in the life of the school and in good teaching the best means. Opposed to formal ethics below the high school.
- Rugh, Charles E., and others.—“Moral Training in the Public Schools.” The California Prize Essays. \$1.50, Ginn. The fourth essay contains suggestions of practical value.
- Sadler, M. E. (Editor).—“Moral Instruction and Training in Schools—Report of an International Inquiry.” 2 vols., \$3.00, Longmans. A world view of the subject, describing different national policies for moral training.
- Schroeder, H. H.—“The Psychology of Conduct.” \$1.25, Row, Peterson. A practical treatment of the subject of training in social conduct.
- Seth, James.—“A Study of Ethical Principles.” \$2.00, Scribner. Traces the course of ethical thought and presents a discussion of the principles which must underlie a system of ethics.
- Sisson, Edward O.—“The Essentials of Character.” \$1.00, Macmillan. A forceful, direct discussion of the subject of character as “springing from native impulses and tendencies, which moral education must direct into the service of human ideals.”

2. Books containing directions and material for the application of suggested lines of work:

- Beveridge, Albert J.—“The Young Man and the World.” \$1.50, Appleton.
- Bryce, James.—“The Hindrances to Good Government.” \$1.15, Yale University Press.
- Cabot, Mrs. Ella L.—“Everyday Ethics.” \$1.25, Holt. (See, by the same author, “An Experiment in the Teaching of Ethics,” *Educational Review*, 34 : 434-47.).

- Canfield, James H.—“The College Student and His Problems.” \$1.00, Macmillan.
- Coler, C. S.—“Character Building.” \$.75, Hinds, Noble.
- Davis, J. B.—“Plan for Vocational Guidance in the City of Grand Rapids,” 1910.
- Dole, Charles F.—“The American Citizen.” \$.80, Heath.
- Drysdale, William.—“Helps for Ambitious Girls.” \$1.50, Crowell.
- Dunn, A. W.—“The Community and the Citizen.” \$.80, Heath.
- Eliot, Charles W.—“The Durable Satisfaction of Life.” First Four Essays. \$1.00, Crowell.
- Everett, C. C.—“Ethics for Young People.” \$.50, Ginn.
- Gulick, Luther H.—“The Efficient Life.” \$1.20, Doubleday, Page.
- Hadley, A. T.—“Standards of Public Morality.” \$1.00, Macmillan.
- Hadley, A. T.—“Morals in Modern Business.” \$1.25, Yale University Press.
- Hyde, William D. W.—“Practical Ethics.” \$.80, Holt.
- Jenks, Jeremiah W.—“Life Questions of High School Boys.” \$.40, Y. M. C. A., New York, 1908.
- Larned, Joseph N.—“A Primer of Right and Wrong.” \$.70, Houghton.
- McLeod, L. C.—“A Young Man's Problems.” \$.50, Flanagan.
- Markwick, W. F., and Smith, W. A.—“The True Citizen.” \$.60, American Book Co.
- Munger, Theodore T.—“On the Threshold.” \$1.00, Houghton.
- Parsons, Frank.—“Choosing a Vocation.” \$1.00, Houghton.
- Parton, James.—“Captains of Industry; or, Men of Business Who Did Something Besides Making Money.” 2 vols., \$1.25 each, Houghton.
- Phillips, J. H.—“Old Tales and Modern Ideals.” \$1.00, Silver, Burdett.
- Reich, Emil.—“Success in Life.” \$1.50, Duffield.
- Reid, Whitelaw, and others.—“Careers for the Coming Men.” \$1.50, Saalfeld.
- Rollins, Frank W.—“What Can a Young Man Do?” \$1.50, Little, Brown.
- Roosevelt, Theodore.—“Applied Ethics.” William Belden Noble Lectures, 1910. \$.75, Harvard University.
- Root, Elihu.—“The Citizen's Part in Government.” \$1.00, Scribner.

- Sharp, Frank C.—“Success: A Course in Moral Instruction for the High School.” Madison, Wis., 1909.
- Smiles, Samuel.—“Self-Help.” Edited by R. H. Bower. \$.60, American Book Co.
- Stockwell, Herbert G.—“Essential Elements of Business Character.” \$.60, Revell.
- Stoddard, John S.—“What Shall I Do?” \$1.00, Hinds, Noble.
- Strong, Josiah.—“The Times and Young Men.” \$.75, Baker.
- Warner, B. E.—“The Young Woman in Modern Life.” \$.85, Dodd, Mead.
- Washington, Booker T.—“Character Building.” \$1.50, Doubleday, Page.
- Weaver, E. W. (Chairman of Committee).—“Choosing a Career: A Circular of Information for Boys.” Prepared for the High School Teachers’ Association, New York City, 1909. A similar circular is issued for girls.
- Wilbur, Mary A.—“Every-day Business for Women,” chap. XVIII. \$1.25, Houghton.
- Wilson, Calvin D.—“Making the Most of Ourselves.” First and Second Series. \$1.00, McClurg.
- Wingate, Charles F.—“What Shall Our Boys Do for a Living?” \$1.00, Doubleday, Page.

CHAPTER XIX

PHYSIOLOGY AND HYGIENE

(The books marked with an asterisk deal with the more general phases of hygiene and physical education, and might with profit be read by high school pupils.)

- *Allen, W. H.—“Civics and Health.” \$1.25, Ginn. An excellent book.
- Bancroft, J. H.—“Games for the Playground, Home, School, and Gymnasium.” \$1.50, Macmillan.
- *Chittenden, R. H.—“Studies in Physiological Chemistry.” \$4.00, Scribner.
- *Clouston, T. S.—“The Hygiene of Mind.” \$2.50, Dutton.
- Dawson, W. H.—“School Doctors in Germany,” London, 1908.

- *Dudley, G., and Kellor, F. A.—“Athletic Games for Women.” \$1.25, Holt.
- *Fisher, Irving.—“National Vitality: Its Wastes and Conservation.” “Report of the National Conservation Commission,” vol. III, pp. 620-751, Washington, 1909. A very important contribution; thorough discussion of the unnecessary economic loss from disease, etc.
- *Gulick, L. H.—“Physical Education by Muscular Exercise.” \$1.75, Blakiston. A valuable book.
- Gulick, L. H., and Ayres, L. P.—“Medical Inspection of Schools.” \$1.00, Charities Publication.
- *Gulick Hygiene Series. Ginn. Intended primarily for use in the grades, but read with interest and profit by high school pupils.
- Henderson, C. H.—“Education with Reference to Sex.” The Eighth Year Book of the National Society for the Scientific Study of Education, Chicago, 1909. An excellent discussion of the different aspects of this subject. It contains a good bibliography.
- Hogarth, A. H.—“Medical Inspection of Schools,” London, 1909. A good discussion of medical inspection in England.
- Hunt, Caroline L.—“The Daily Meals of School Children,” U. S. Bureau of Education, Bulletin No. 3, 1909.
- Johnson, G. E.—“Education by Plays and Games.” \$.90, Ginn.
- Lloyd, F. E., and Bigelow, M. A.—“The Teaching of Biology in the Secondary Schools.” \$1.50, Longmans. It contains a good chapter on the teaching of physiology.
- *Mero, E. B.—“American Playgrounds.” \$1.50, American Gymnasia Co.
- Porter, Charles.—“School Hygiene and the Laws of Health.” Longmans.
- “Proceedings of the Conference on the Teaching of Hygiene and Temperance in the Universities and Schools of the British Empire,” London, 1907.
- “Proceedings and Year Book of the Playground Association of America,” for 1907, 1908, and 1909, New York.
- “Proceedings of the First, Second, and Third Congresses of the American School Hygiene Association,” Springfield, 1910.
- “Proceedings of the Fourth Congress of the American School Hygiene Association,” Springfield, 1910.

- Reports of the International Congress of School Hygiene:
 "Bericht ueber den I. Internationalen Kongress für Schulhygiene,"
 Nürnberg, 1904.
 "Transactions of the Second International Congress on School Hygiene," London, 1907.
 "III. Congrès International d'Hygiène Scholaire," Paris, 1910.
 *Sargent, D. A.—"Physical Education." \$1.50, Ginn.
School Science and Mathematics, 10 vols., Chicago, 1901-1910.
 Contains a number of excellent articles on the teaching of physiology.
 Welpton, W. P.—"Physical Education and Hygiene." \$1.75, W. B. Clive, London, 1908.
 *Wood, T. H.—"Health and Education." The Ninth Year Book of the National Society for the Study of Education, Chicago, 1910. Strong chapters on "Health Instruction" and "Physical Education."

CHAPTER XX

SEX PEDAGOGY IN THE HIGH SCHOOL

- Acher.—"The Psychology, Pedagogy, and Hygiene of Sex Development."
 Cramer, A.—"Pubertät und Schule," Leipzig.
 Dock, Lavinia.—"Hygiene and Morality." Putnam.
 Eckstein, E.—"Die Sexualfrage in der Erziehung des Kindes."
 Forel, A.—"Die Sexuelle Frage."
 Fürth, H.—"Die geschlechtliche Aufklärung in Haus und Schule."
 Hall, G. S.—"Educational Problems," vol. I, chap. VII, Appleton.
 Henderson, C. R.—"Eighth Year Book of the National Society for the Study of Education," 1909.
 Höller, K.—"Die Sexuelle Frage und die Schule," Leipzig.
 Moll, A.—"Die Sexuelle Erziehung." *Zeitsch. f. päd. Psy. Path. und Hygiene*, 1908.
 Parkinson, W. D.—"Sex and Education." *Educational Review*, Jan. 1, 1911.
 Renault, J.—"Comment preparer l'enfant an respect des questions sexuelles." *Education Familiale*, vol. VIII, 1907.

- Sarason, D.—“Zum Problem der Sexual-belehrung.” *Zeitsch. f. Schulgesundheitspflege*, vol. XX, 1907.
- Schmidt, B.—“In *Zeitsch. f. lateinlose höhere Schulen*,” vol. XVII, 1905-6.
- Kongress der deutschen Gesellschaft zum Bekämpfung der Geschlechtskrankheiten, Sexualpädagogik, Barth, Leipzig, 1907.
- Articles by Mast, Kleinschmidt, Siebert, and others in *Natur und Schule*, Leipzig, 1906.
- Articles in *Mutterschutz*, *Zeitschr. f. Kinderforschung*, *Zeitschr. f. Schulgesundheitspflege*, *Die Neue Generation*, and *Die Neue Deutsche Schule*.

CHAPTER XXI

AGRICULTURE

The literature of agricultural education in secondary schools consists largely of the publications of the United States Department of Agriculture, short articles, addresses, and committee reports to be found in educational journals and in the proceedings of the National Education Association. The few more pretentious works and their principal characteristics are here noted:

- Bailey, Liberty Hyde.—“On the Training of Persons to Teach Agriculture in the Public Schools.” United States Bureau of Education, Bulletin No. 1, 1908. Pp. 52. Has a good bibliography.
- Bricker, Garland Armor.—“The Teaching of Agriculture in the High School.” \$1.00, Macmillan. The latest work devoted mainly to pedagogical phases of the problem. Teaching principles well illustrated by sample exercises.
- Davenport, Eugene.—“Education for Efficiency.” \$1.00, Heath. Pp. 184, 1909. Part I is a series of addresses on general phases of industrial education and, in part, an argument against the establishment of special agricultural high schools. Part II treats of agriculture as a part of the curriculum.

- Davis, Benjamin Marshall.—Series of articles in *Elementary School Teacher*, vols. X and XI, on various phases and agencies of agricultural education. Also has a good bibliography. Issued in book form by University of Chicago Press, under title of "Recent Developments in Agricultural Education."
- Jewell, James Ralph.—"Agricultural Education." United States Bureau of Education, Bulletin No. 2, 1907. Chapters on secondary and other phases of the subject. Gives a general view of the foreign field and bibliography complete to the date of issue.
- Main, Josiah.—"Educational Agriculture." Issued as a bulletin of the State Normal School, Hays, Kansas. Pp. 74, 1910. Principally a discussion of the psychological basis of agricultural instruction. Furnishes excellent lists for laboratory equipment.
- Robison, Clarence Hall.—"Agricultural Instruction in the High Schools of the United States." \$1.50. Columbia University Contributions to Education, Teachers College Series. Pp. 205, 1911. Descriptive and statistical treatment of the movement. Bibliography brought down to 1911 and arranged for topical reference.
- Most prominent among the many works written for reference, general reading, and for use in the colleges, are those edited by Bailey: "The Rural Science Series," the "Cyclopædia of American Agriculture" (Macmillan), and the "Cyclopædia of American Horticulture" (Macmillan).

CHAPTER XXII

COMMERCIAL EDUCATION

A great deal has been written upon the subject of commercial education. The articles mentioned in the following references will enable one to obtain a good general idea of the current thought on the subject. These articles cover practically all phases of the subject, not only of commercial education in general, but also a considerable number of special features of the subject.

- Clark, G. A.—"Commercial Branches in the High School Curriculum." *Educational Review*, June, 1909.
- Curry, James S.—"Past, Present, and Future of Commercial Education." *Journal National Education Association*, 1910.
- DeGarmo, Charles.—"Methods of Preparing Teachers of Commercial Schools in Germany." *Journal National Education Association*, 1908.
- Ellis, C. B.—"Purpose of a Good Business Department in a Public High School." *School Review*, Feb., 1903.
- Garbutt, J. R.—"The High School Commercial Course: Its Subjects, Their Practical and Educational Value." *Journal National Education Association*, 1908.
- Green, J. M.—"The Relation between General and Commercial Education." *Journal National Education Association*, 1907.
- Herrick, Cheesman A.—"Commercial Education as a Branch of Vocational Training." *Journal National Education Association*, 1910.
- Herrick, Cheesman A.—"Preparation and Improvement of Commercial Teachers." *Journal National Education Association*, 1908.
- Irish, C. W.—"Place of Commercial Studies in the High School." *School Review*, Sept., 1902.
- Lakey, Frank E.—"How to Make Commercial Courses More Efficient." *Journal National Education Association*, 1910.
- Laughlin, J. S.—"Higher Commercial Education." *Atlantic Monthly*, May, 1902.
- Person, H. S.—"Professional Training for Business." *World's Work*, May, 1904.
- Pitman, J. A.—"The Education and Professional Training of Commercial Teachers." *Journal National Education Association*, 1910.
- Stevenson, W. C.—"Qualification of Commercial Teachers." *Journal National Education Association*, 1905.
- Walker, J. Brisben.—"What Should Be the Education of a Business Man?" *Journal National Education Association*, 1905.

The annual reports for the past ten years of the National Commercial Teachers' Federation contain a vast amount of interesting and valuable material on practically every phase of commercial education. Information as to these reports may be obtained from Mr. J. C. Walker, secretary of the Federation, Detroit, Mich.

CHAPTER XXIII

VOCATIONAL TRAINING IN THE HIGH SCHOOL AND ITS RELATION
TO MANUAL TRAINING

- Bloomfield, Meyer.—“The Vocational Guidance of Youth.” Riverside Educational Monographs. \$.35, Houghton.
- Dean, A. D.—“The Worker and the State.” \$1.20, Century Co. The best single treatise on the need of industrial education in the United States. Contains a valuable bibliography.
- Gillette, J. M.—“Vocational Education.” \$1.00, American Book Co. A somewhat philosophical treatment of the subject, showing the influence on society of vocational training.
- Kerschensteiner, George.—“Education for Citizenship.” \$1.00, Rand, McNally.
- Kimball.—“Industrial Education.” Published by School of Education, Cornell University, 1911, \$.50.
- Parsons, F.—“Choosing a Vocation.” \$1.00, Houghton.
- Wright, C. D.—“The Industrial Evolution of the United States.” \$1.25, Scribner.
- “Report of Committee on the Place of Industries in Public Education,” submitted to the National Council of Education, July, 1910. Published in *Proceedings of National Education Association*, Winona, Minnesota, 1910. A most comprehensive and valuable report, combining the historical, theoretical, and practical aspects of the subject.
- “Annual Report of the Superintendent of Schools of the City of Boston,” 1910. An interesting statement of the progressive steps taken in the direction of vocational training by the city of Boston.
- “Bulletins of the National Society for the Promotion of Industrial Education,” Nos. 1-13: especially No. 2, “Selected Bibliography on Industrial Education;” No. 11, “A Descriptive List of Trade and Industrial Schools in the United States;” No. 12, “Legislation upon Industrial Education in the United States;” No. 14, “The Trade Continuation Schools of Munich.” Published by the Society, 20 West 44th Street, New York City.

- "Report of Special Committee on Industrial Education," submitted to the American Federation of Labor, Toronto, Nov., 1909. Published by the American Federation of Labor, Washington, D. C.
- "Report of Michigan State Commission on Industrial and Agricultural Education," Dec., 1910. Published by the Commission, S. O. Hartwell, Kalamazoo, Michigan, secretary.
- "Report of Special Investigation of Industrial Education by Department of Commerce and Labor." Washington, D. C., 1911.
- "Industrial Education," in *Teachers College Record*, September, 1911, Columbia University, New York, \$.30.
- "Report of Commission Upon Plans for the Extension of Industrial and Agricultural Training in the State of Wisconsin." Published by The Commission, Madison, Wis., 1911.

CHAPTER XXIV

PRACTICAL ARTS FOR GIRLS

Economics of clothing:

- Dooley.—"Textiles." \$1.00, Heath.
- Richards, Ellen H.—"The Cost of Living." \$1.00, Wiley.

Home sanitation:

- Gulick, Charlotte V.—"Emergencies." \$.40, Ginn.
- Jewett, Frances G.—"Town and City." \$.50, Ginn.
- Osborne, Charles Francis.—"The Family House." \$1.00, Penn Pub. Co.
- Terrill, Bertha M.—"Household Management." \$1.25, From the Library of Home Economics, The American School of Home Economics, Chicago.
- Wilbur, Mary A.—"Every-day Business for Women." \$1.25, Houghton.

House furnishing:

- Daniels, Fred. H.—"Furnishing a Modest Home." \$1.00, Davis Press.

Social relations and conduct:

- Bishop, Emily M.—"Daily Ways to Health." \$1.50, Huebsch.
 Conyington, Mary.—"How to Help." \$1.50, Macmillan.
 Jewett, Frances G.—"Good Health." \$.40, Ginn.
 Learned, Mrs. Frank.—"Etiquette of New York To-day." \$1.25, Stokes.
 Learned, Mrs. Frank.—"Moral Instruction in the Ethical Culture School," Edited by Superintendent Lewis, Central Park West and 63d Street, New York.

Recreation and enjoyment:

- Bancroft, Jessie H.—"Games for the Playground, Home, School, and Gymnasium." \$1.50, Macmillan.
 Blanchan, Neltje.—"Nature's Garden" (Wild Flowers). \$3.00, Doubleday, Page.
 Henderson, W. J.—"What is Good Music." \$1.00, Scribner.
 Krehbiel, H. E.—"How to Listen to Music." \$1.25, Scribner.
 Martin, Martha Evans.—"The Friendly Stars." \$1.25, Harper.
 Miller, Olive Thorne.—"First Book of Birds." \$1.00, Houghton.
 Parkhurst, H. E.—"The Birds' Calendar." \$1.50, Scribner.
 Upton, G. P.—"The Standard Operas." \$1.50, McClurg.
 Upton, G. P.—"The Standard Symphonies." \$1.50, McClurg.
 Van Dyke, John C.—"How to Judge a Picture." \$.60, Hunt and Eaton.
 White, Mary.—"How to Make Baskets." First and Second Books. \$1.00, Doubleday, Page.
 White, Mary.—"Handbook of Sports." Girls' Branch Public Schools Athletic League of New York City. Spalding.

CHAPTER XXV

PSYCHOLOGY IN THE HIGH SCHOOL

The historical aspect:

- Brown, E. E.—"The Making of Our Middle Schools," chapters on academies. \$3.00, Longmans.
 Calkins, M. W.—"Introduction to Psychology," chap. XXVIII. \$2.00, Macmillan.

Külpe, O.—“Outlines of Psychology,” Introduction. \$2.60, Macmillan.

Villa.—“Contemporary Psychology,” chap. I. \$2.75, Macmillan.

FOR CLASS ROOM USE:

Several are mentioned which would not be complete enough for use as the text-book basis of a course, although they are valuable for high school use.

Baldwin, J. M.—“Story of the Mind.” \$.35, Appleton.

Betts, G. H.—“The Mind and Its Education.” \$1.25, Appleton.

Charters, W. W.—“Methods of Teaching.” \$1.10, Row, Peterson.

Harvey, N. A.—“Principles of Teaching.” \$1.25, Row, Peterson.

James, William.—“Talks to Teachers.” \$1.50, Holt.

Kirkpatrick, E. A.—“Fundamentals of Child Study.” \$1.25, Macmillan.

McKenny, C.—“The Personality of the Teacher.” \$1.00, Row, Peterson.

McMurry, C.—“How to Study.” \$1.25, Houghton.

O’Shea, M. V.—“Education as Adjustment.” \$1.50, Longmans.

Thorndike, E. L.—“Human Nature Club.” \$1.25, Longmans.

Titchener, E. B.—“Primer of Psychology.” \$1.00, Macmillan.

Wenzlaff, G. G.—“The Mental Man.” \$1.10, Merrill.

There are special chapters in Dewey’s “How We Think” and in Miller’s “Psychology of Thinking,” especially those which make practical for education the doctrines of functional psychology that are simple enough for high school use.

I am inclined to recommend to high school teachers of psychology either the book by Betts or that by Wenzlaff as the basis of the course and then to group around this most closely special selections from McMurry, Dewey, Miller, Charters, and James, reaching out into other books according as these may not supply the material wanted in the course.

For the teacher:

Angell, J. R.—“Psychology.” \$1.50, Holt.

Bolton, F. E.—“Principles of Education.” \$3.00, Scribner.

Calkins, M. W.—“A First Book in Psychology.” \$1.90, Macmillan.

Calkins, M. W.—“Introduction to Psychology.” \$2.00, Macmillan.

- Dewey, J.—“How We Think.” \$1.00, Heath.
- Ebbinghaus, H.—“Psychology : An Elementary Text-Book.” \$1.20, Heath.
- Hall, G. S.—“Youth.” \$1.50, Appleton.
- Henderson, E. N.—“Principles of Education.” \$1.75, Macmillan.
- Horne.—“Philosophy of Education.” \$1.50, Macmillan.
- Judd, C. H.—“Psychology: General Introduction.” \$1.50, Scribner.
- King, I.—“Psychology of Child Development.” \$1.00, University of Chicago Press.
- Kirkpatrick, E. A.—“Genetic Psychology.” \$1.25, Macmillan.
- McDougall, W.—“Introduction to Social Psychology.” \$1.50, Luce.
- Miller, I. E.—“Psychology of Thinking.” \$1.25, Macmillan.
- Morgan, C. Lloyd.—“Animal Behavior.” \$2.50, Longmans.
- Morgan, C. Lloyd.—“Psychology for Teachers.” \$1.25, Scribner.
- Ribot, T.—“Psychology of the Emotions.” \$1.50, Scribner.
- Romanes.—“Animal Intelligence.” \$1.75, Appleton.
- Ruediger, W. C.—“Principles of Education.” \$1.25, Houghton.
- Scott, W. D.—“Psychology of Advertising.” \$2.00, Small, Maynard.
- Seashore, C. E.—“Elementary Experiments in Psychology.” \$1.00, Holt.
- Stout, G. F.—“Manual of Psychology.” \$1.50, Hinds, Noble.
- Swift, E. J.—“Mind in the Making.” \$1.50, Scribner.
- Titchener, E. B.—“A Text-Book in Psychology.” \$2.00, Macmillan.
- Washburn, M. F.—“The Animal Mind.” \$1.60, Macmillan.
- Witmer, L.—“Analytic Psychology.” \$1.50, Ginn.

CHAPTER XXVI

THE HIGH SCHOOL LIBRARY

Lists of books suitable for high school libraries have been published by the Minnesota Public School Library Commission, the Departments of Public Instruction of North Dakota and New Jersey, the Oregon Library Commission, and the Education Department of Wisconsin. The list published by the Public Library of Brookline, Mass., entitled “Something to Read for Boys and Girls,” 1908, will be found useful in high school work. The Free Public Library

of Newark, N. J., has published a list of books in the library of the Ballinger High School, Newark, entitled "Reading for Pleasure and Profit." "The Practical Use of Books and Libraries," by Gilbert O. Ward, Supervisor of High School Branches, Cleveland Public Library, published by the Boston Book Co., 1911, is an excellent manual to put into the hands of high school students. A teaching outline to accompany this work is issued separately.

Grateful acknowledgment of help in the preparation of the following list is made to Miss Mary E. Hall, librarian, Girls' High School, Brooklyn, who has done much to better conditions in our high school libraries.

- Abbot, A.—"Reading of High School Pupils." *School Review*, 10 : 585. Statistical tables made up from a list of 178 "best books" submitted to some 2,500 high school pupils for a vote as to their popularity. A black list is made up of books which received the largest number of votes of disapproval, also a reading list of books which proved the most popular. Interesting deductions are submitted as to the kinds of books boys and girls like at various stages of high school development.
- Aley, Robert J.—"Books and High School Pupils." *Proceedings, N. E. A.*, 1909, 844-48.
- Ames, A. S., and Rathbone, J. A.—"Instruction in the Use of Reference Books and Libraries in the High Schools." *Library Journal*, 1898, 23 : c. 86-91. Account of library work done in Mt. Vernon Seminary and Pratt Institute High School; also answers to questions on library work in high schools.
- Anthony, J. B.—"Books as Tools." *Chautauquan*, May, 1900, 31 : 143. Indicates some of the most useful reference books needed by a village library, with prices and reasons for the choice.
- Ashmun, M.—"Library Reading in the High School." *School Review*, 17 : 618-22 and 701-4, Dec. and Nov., 1909, and Mar., 1910. Practical suggestions as to how to conduct library reading classes in the high school, the amount of reading required, and the kind of books selected. Use of pictures recommended, portraits of authors, photographs of places described make the work interesting. Avoid monotony.

- Atkinson, F. W.—“Reading of Young People.” *Library Journal*, 1908, 33 : 129-34. Shows the need of library guidance through the high school period to keep the pupils' reading up to standards set in grammar school.
- Bates, W. H.—“The Library as an Aid to School Work.” *School Review*, 1899, 7 : 179. The education which has not taught the student the love of reading is not a success. The student must acquire the ability to recognize good books and the habit of reading them. But the average student will hardly reach the best results without careful guidance and seasonable suggestions.
- Bishop, W. W.—“School Libraries and Public Libraries.” *Public Libraries*, 1896, 1 : 95. A plea for independent school libraries.
- Bostwick, A. E.—“The Library and the School.” (“The American Public Library,” 1910, pp. 95-107.) Discusses school libraries, school work in libraries, model school collections, Sunday-schools, text-books, and selective education.
- Dana, J. C.—“Book-Using Skill in Higher Education.” *A. L. A. Bulletin*, No. 3, 191-95 (S. 1909). Crying need of instruction in the use of the library for the pupils of high schools, normal schools, colleges, and universities.
- Dorey, Milnor.—“What Are Our High School Pupils Reading?” *School Review*, 1907, 15 : 299.
- Elmendorf, H. L.—“Some Things a Boy of Seventeen Should Have an Opportunity to Read.” *American Monthly Review of Reviews*, 1903, 28 : 713. Suggestions to parents, teachers, and librarians as to what books a boy should read and the time and the manner in which his attention should be called to them.
- Finney, B. A.—“High School Instruction in Use of Reference Books.” *Public Libraries*, 1899, 4 : 315-17. Urges such instruction and outlines a course.
- Fletcher, M. S.—“Instruction to High School Students in the Use of a Library.” *Library Journal*, 1904, 29 : 481. An account of the library work done in the Jamestown High School.
- Gaillard, E. W.—“The Difficulty of the High School Library.” *School Review*, 1907, 15 : 245.

- Hall, M. E.—“What the Librarian May Do for the High School.” *Library Journal*, 1909, 34 : 154. Suggests ways in which the school librarian may help the teachers, interest the pupils, and make the library an effective department.
- Haney, J. D.—“How Shall the Public Libraries Help the High School?” *Public Libraries*, 1902, 7 : 224. Advocates branch libraries in high schools superintended by trained librarian.
- “High School Library Problem.” *School Review*, 1906, 14 : 762.
- Holland, E. O.—“The Library as an Adjunct to the Secondary School.” *Proceedings, N. E. A.*, 1903, 961-66. Teacher and librarian to teach student to do as definite laboratory work in the library as in the sciences, to supplement the poverty of the school text with the riches of the library. Since most of us must be imitators, students should be taught to know and emulate the world's best men. Graduates of high schools, as a result of their education and culture, should be able to improve social and political conditions of city or country.
- Hopkins, Florence M.—“Library Work in High Schools.” *Public Libraries*, 1905, 10 : 170. Gives outline of work done in Detroit Central High School.
- Hopkins, Florence M.—“Methods of Instruction in the Use of High School Libraries.” *Proceedings, N. E. A.*, 1905, 858. A well-selected and well-catalogued library is a university for the people and it is the duty of the high school to train pupils to appreciate these library universities. In Detroit Central High School they have systematized the teaching of simple reference points, one English lesson a term being devoted to the study of library aids.
- Hopkins, Florence M.—“The Place of the Library in High School Education.” *Library Journal*, Feb., 1910, 35 : 55-60. Points out the great lack and greater need of systematic instruction in the use of reference books and reference guides. Outlines briefly a course of eight simple lessons.
- Johnston, W. D.—“The Library as a Reinforcement of the School.” *Proceedings of the Forty-seventh University Convocation of the State of New York*, Oct., 1909. N. Y. (State) Education Department, Bulletin No. 460, Dec., 1909. *American Education*, 13 : 208-11. The library must be recognized as an

integral part of the educational system, not merely an adjunct to the school, but a complement to it. It is recommended that the superintendent of schools be a member of the board of library trustees and that the librarian be a member of the school board. The value of collateral and vacation reading is discussed.

Jones, Ralph K.—“A Problem of the College and School Library.” *Library Journal*, Jan., 1912, 37 : 22-23. Gives figures showing that the schools are sending to college and into the world graduates untrained in the use of libraries and not given to their habitual use, and urges the establishment in every school of a library which shall contain suitable reference books. Co-operation between the public library and the school libraries should be expected and required.

Judd, C. H.—“The School and the Library.” *Elementary School Teacher*, Sept., 1910, 11 : 28-35; also in *A. L. A. Bulletin*, Sept., 1910, 4 : 607-11. Suggests the use of the “study period” for work in the library.

Matthews, Brander.—“Books and Boys.” *Independent*, 67 : 1117-19, Nov. 18, 1909. Plea not to expect passionate and enthusiastic admiration from college students of the masterpieces, literature not suited to their years or experience, but to lead them to read those books which a healthy, manly taste demands.

Miner, L. B.—“Voluntary Reading in the English High School.” *School Review*, 1905, 13 : 180. The “chief end” of pupils in the English high school is not college, but culture and self-support. The majority come from poor, illiterate homes and do much outside work. What is most needed is a public school Carnegie. A book in the hand is worth two in the stack. One of the best methods of arousing interest is to read one or two wily selections and then offer to loan the book. Having a recitation period for the reading club to talk over voluntary reading and give reports is satisfactory.

New York Library Association. Committee on High School Libraries. Report on the high school libraries of New York State. *New York Libraries*, Jan., 1910, 2 : 57-61. Suggestions to remedy the lack of co-operation between the public library and the school libraries.

- Olsen, J. W.—“The School and the Library.” *Proceedings, N. E. A.*, 1907, 117.
- Outline of a scheme for co-operation between the high schools and public library of Brooklyn, N. Y. *Library Journal*, 34 : 146.
- Parlin, C. C.—“Successful High School Library at Wausau, Wis.” *School Review*, 1907, 15 : 251-54.
- Sharp, K. L.—“Libraries in Secondary Schools.” *Library Journal*, 1895, 20 : c. 5-11. See especially pages 9-11. Contains also a tabulated statement as to library conditions in high schools in different States.
- Stearns, Lutie E.—“The Problem of the Girl.” *Library Journal*, 1906, 31 : c. 103. Contains suggestions for interesting girls in good literature and makes a plea for intermediate departments in libraries.
- “The Library in the School” (editorial), *Dial*, Feb. 1, 1906, 40 : 73. One of the best articles arguing for the necessity of a library in the high school as a working laboratory for the work of the entire school, but particularly for the English and history departments.
- Thurber, Samuel.—“Voluntary Reading of High School Students.” *School Review*, 1905, 13 : 168-79. The prejudices of English teachers, the simple and crude quality of pupils' reading, above all, the literature studied in class: these form the chasm between voluntary reading and classical high school English—a chasm that cannot be bridged till teachers of English take an interest in the pupils' reading instead of calling it “trash” and when the literature is not composed of books totally unsuited to the tastes of normal boys and girls. The ideal training for a teacher of English is to spend some time as an assistant in the children's department of a large public library.
- Ward, Gilbert O.—“The High School Library.” Paper read before Library Section, New York State Teachers' Association, Rochester, Dec., 1910.
- Wright, R. H.—“How to Make the Library Useful to High School Students.” *Public Libraries*, 10 : 460-62. Also in *Proceedings, N. E. A.*, 1905. An excellent article on the use of the library as a necessary department in the high school.

APPENDIX

ARTICULATION OF HIGH SCHOOL AND COLLEGE

REPORT ADOPTED BY THE SECONDARY DEPARTMENT OF THE
NATIONAL EDUCATION ASSOCIATION

SAN FRANCISCO, JULY 11, 1911

TO THE SECONDARY DEPARTMENT OF THE NATIONAL EDUCATION
ASSOCIATION.

Your Committee upon the Articulation of High School and College herewith submits the following report:

At the meeting of this department in Boston, July 6, 1910, resolutions were introduced requesting colleges to discontinue the entrance requirement of two foreign languages and to recognize as electives all subjects well taught in the high school. These resolutions furthermore stated that the public high schools will be greatly hampered in their attempts to serve the best interests of boys and girls until such modification is made by the colleges. These resolutions were adopted with only one dissenting vote. In accordance with the spirit of these resolutions, your committee of nine was appointed to prepare a rational statement of the work that the high school should do. To carry out this purpose, the committee submits:

- A. Some preliminary considerations on the field and function of education in the high school,
- B. A working definition of a well-planned high school course, and
- C. Reasons for the adoption of this definition as the basis of college admission.

A. SOME PRELIMINARY CONSIDERATIONS ON THE FIELD AND FUNCTION OF EDUCATION IN THE HIGH SCHOOL

1. Dr. Henry S. Pritchett, in his Annual Report as President of the Carnegie Foundation, finds that American education, from elementary school to college, is suffering from the attempt to teach too many subjects to the same student at the same time. He believes

that students taking the newer subjects should not be required to carry all the older subjects. He states emphatically that this is no argument against the enriched curriculum of the high school; but that, on the contrary, the high school must go on still further enriching its curriculum, and that it is the duty of the college to adjust itself to the high school thus broadened.

2. It is the duty of the tax-supported high school to give every student instruction carefully designed to return to society intelligent, able-bodied, and progressive citizens. To this end certain work should be included in the course of every student whether or not he contemplates entering a higher institution. The responsibility of the high school in this matter cannot be delegated to the college because there is no guarantee that the particular student will actually go to college.

3. It is coming to be recognized that in a democratic society the high school has a distinct function. The high school period is the testing time, the time for trying out different powers, the time for forming life purposes. Consequently, the opportunity should be provided for the student to test his capacity in a fairly large number of relatively diverse kinds of work.

In the high school the boy or girl may very properly make a start along the line of his chosen vocation, but a final choice should not be forced upon him at the beginning of that career. If he makes a provisional choice early in the course, there should be ample opportunity for readjustment later in the high school. For this reason the requirement of four years of work in any particular subject, as a condition of admission to a higher institution, unless that subject be one that may properly be required of all high school students, is illogical and should, in the judgment of this committee, be immediately discontinued.

4. Not only is it the duty of the high school to lay the foundations of good citizenship and to help in the wise choice of a vocation, but it is equally important that the high school should make specific contribution to the efficiency of the individual along various broad lines. In our industrial democracy the development of individual aptitudes and unique gifts is quite as important as the development of the common elements of culture. Moreover, hard work is to be secured not by insistence upon uniformity of tastes and interests, but by the encouragement of special effort along lines that appeal to the

individual. Our education would gain in power and in virility if we made more of the dominant interest that each boy and girl has at the time. It would seem that some have come to believe the oft-repeated statement that the liberal should precede the vocational; but an organic conception of education demands the early introduction of training for individual usefulness, thereby blending the liberal and the vocational; for only then does the liberal receive its social significance and importance. In other words, the boy who pursues both the liberal and the vocational sees the relation of his own work to the work of others and to the welfare of society; whereas the liberal without the vocational leaves him a mere spectator in the theatre of life and the boxes in this theatre are already overcrowded.

5. Mechanic arts, agriculture, or household science should be recognized as rational elements in the education of all boys and girls, and especially of those who have not as yet chosen their vocation. Under the authority of the traditional conception of the best preparation for a higher institution, many of our public high schools are to-day responsible for leading tens of thousands of boys and girls away from the pursuits for which they are adapted and in which they are needed, to other pursuits for which they are not adapted and in which they are not needed. By means of exclusively bookish curricula false ideals of culture are developed. A chasm is created between the producers of material wealth and the distributors and consumers thereof.

The high school should in a real sense reflect the major industries of the community which supports it. The high school, as the local educational institution, should reveal to boys and girls the higher possibilities for more efficient service along the lines in which their own community is industrially organized.

Our traditional ideals of preparation for higher institutions are particularly incongruous with the actual needs and future responsibilities of girls. It would seem that such high school work as is carefully designed to develop capacity for and interest in the proper management and conduct of a home should be regarded as of importance at least equal to that of any other work. We do not understand how society can properly continue to sanction for girls high school curricula that disregard this fundamental need, even though such curricula are planned in response to the demand made by some of the colleges for women.

B. A WORKING DEFINITION OF A WELL-PLANNED HIGH SCHOOL COURSE

In view of the foregoing considerations on the field and function of the high school, and to secure courses that shall be sound as integral parts of the larger educational process, your committee recommends the adoption of the following definition of a well-planned high school course:

1. THE QUANTITATIVE REQUIREMENT SHOULD BE FIFTEEN UNITS.

"A unit represents a year's study in any subject in a secondary school, constituting approximately a quarter of a full year's work." This definition "assumes that the length of the school year is from thirty-six to forty weeks, that a period is from forty to sixty minutes in length, and that the study is pursued for four or five periods per week." It further assumes that two hours of manual training or laboratory work is equivalent to one hour of class room work.

We believe that fifteen units is a better requirement than sixteen units, because:

- (1) Quantity should be subordinated to quality.
- (2) Overstrain should be eliminated from the atmosphere of the school.
- (3) There should be one unit leeway, inasmuch as failure in one unit in one year should neither cost the student an extra year nor tempt the principal to permit such student to try to carry an extra unit the succeeding year.

(4) Students of exceptional ability should be permitted to earn five units per year, thereby shortening the high school period by one year.

(5) Students poor in ability should be required to spend five years upon the course, attempting and performing three units each year, thereby diminishing failures and reducing excessive per capita cost of instruction.

Where fifteen units is adopted as the required number, it would seem reasonable that physical training and chorus singing should not be counted toward the fifteen units.

We further recommend that the practice of admitting students to college weighed down with conditions be disapproved on the ground that it is injurious to the student, to the high school from which he comes, and to the college to which he goes.

2. EVERY HIGH SCHOOL COURSE SHOULD INCLUDE AT LEAST THREE UNITS OF ENGLISH, ONE UNIT OF SOCIAL SCIENCE (INCLUDING HISTORY), AND ONE UNIT OF NATURAL SCIENCE.

(1) *English*.—There is at the present time almost unanimous agreement among high school and college authorities that three or four units of English should be required of all. But the high school should be granted freedom to adapt the work to the real needs of its boys and girls. A course that is good in one high school may not be suited to the needs of another high school. Uniformity in this subject is utterly disastrous.

(2) *Social Science* (including history).—High school courses in history should always be taught so as to function in a better understanding of modern institutions, current events, and present movements.

Courses in economics should be encouraged. Economic discussions are paramount and ignorance of economic principles is appalling.

Every high school student should be given a practical knowledge of affairs in his own community, political, industrial, and philanthropic; of the basic principles of State and national politics; and of movements for social reform and international peace.

Any high school course that secures part or all of the above results should be given full recognition.

(3) *Natural Science*.—Where a unit of introductory science is taught, it should be recognized as fulfilling the minimum requirement in natural science.

In some schools an introductory course has been worked out based upon physics, with a minimum of principle and a maximum of application, as most advantageously meeting the needs of the pupils. In such a course there should be strict insistence upon accuracy and neatness in the presentation of note-books and laboratory exercises. Opportunity should be given for individual pupils to work along special lines, and to make contributions out of their studies to the work of the class as a whole.

In other schools introductory science is based largely upon biology. General biological material is used to explain human functions. Personal hygiene, including sex hygiene, is taught. Special attention is paid to problems of ventilation, sanitation, and the elimination of preventable diseases. Effort is made to secure intelligent co-operation with health authorities and to form public opinion re-

garding higher standards of health. A certain amount of physics and chemistry is also introduced in this course.

Either of these introductory courses would be placed intentionally in the first or second year of the high school.

(4) *Physical Training*.—Systematic physical training, consisting of exercises and team games, should be required of all students; but this work should not be regarded as counting toward the fifteen required units.

3. EVERY HIGH SCHOOL COURSE SHOULD INCLUDE THE COMPLETION OF TWO MAJORS OF THREE UNITS EACH AND ONE MINOR OF TWO UNITS, AND ONE OF THE MAJORS SHOULD BE ENGLISH.

Irrespective of the possibility that the student may go to a higher institution, it is desirable for him to do in the high school a certain amount of work of an advanced character. This provision also makes it possible for a part of the work in college to be a continuation of work done in the high school, thereby preserving continuity in the educational process.

We recommend that the following be recognized as majors:

- (a) 3 units of English. (Required of all.)
- (b) 3 units of one foreign language. (Latin, German, French, or Spanish.)
- (c) 3 units of mathematics. (To include elementary algebra and plane geometry, and selections from plane trigonometry, solid geometry, intermediate algebra, and advanced algebra.)
- (d) 3 units of social science. (To include selections from history, civics, economics, municipal affairs, and history of industry or commerce.)
- (e) 3 units of natural science. (To include selections from an introductory science course, physics, chemistry, astronomy, agriculture, physiography, elementary biology, advanced physiology, botany, and zoology.)

4. THE REQUIREMENT IN MATHEMATICS AND IN FOREIGN LANGUAGES SHOULD NOT EXCEED TWO UNITS OF MATHEMATICS AND TWO UNITS OF ONE LANGUAGE OTHER THAN ENGLISH.

For admission to engineering courses, the requirement of a major in mathematics appears reasonable.

For admission to a distinctively literary or classical course, the requirement of a major in one foreign language appears reasonable.

For other students a requirement of more than two units of mathematics and two units of one language, when not in accord with the dominant interests and aptitudes of the student, appears excessive.

5. OF THE TOTAL FIFTEEN UNITS, NOT LESS THAN ELEVEN UNITS SHOULD CONSIST OF ENGLISH, FOREIGN LANGUAGE, MATHEMATICS, SOCIAL SCIENCE (INCLUDING HISTORY), NATURAL SCIENCE, OR OTHER WORK CONDUCTED BY RECITATIONS AND HOME STUDY.

THE OTHER FOUR UNITS SHOULD BE LEFT AS A MARGIN TO BE USED FOR ADDITIONAL ACADEMIC WORK OR FOR MECHANIC ARTS, HOUSEHOLD SCIENCE, COMMERCIAL WORK, AND ANY OTHER KIND OF WORK THAT THE BEST INTERESTS OF THE STUDENT APPEAR TO REQUIRE.

No limitations should be imposed upon the use of the margin except that the instruction should be given by competent teachers with suitable equipment in classes not too large, and that the student's work should be of a satisfactory grade.

The recommendation that the subjects from which the margin may be made up should be left entirely unspecified appears to be vital to the progressive development of secondary education. As long as formal recognition must be sought for each new subject, so long will the high school be subservient and not fully progressive. It ought to be possible for any strong high school at any time to introduce into its curriculum a subject that either meets the peculiar needs of the community or that appears to be the most appropriate vehicle for teachers of pronounced individuality.

This margin of four units is not excessive. It amounts to an average of only one unit a year. A course containing eleven units of academic or prepared work requires the student to carry, practically throughout the course, three of these subjects at a time. In general, this involves the preparation of three lessons a day outside of the class room. A daily assignment of more than three lessons, together with manual training or vocational work in school hours, is not conducive to a high standard of excellence. In many of our high schools, girls, especially, are subjected to a scholastic routine not designed to develop a strong race, either physically or mentally. (Note.—Placing the number of required units of academic or pre-

pared work at eleven instead of twelve allows a leeway of one unit in case of a failure in the academic work. In case of no failure by taking four units each year the student may accomplish either an extra academic unit or an extra vocational unit.)

The provisions of the foregoing definition may be summarized as follows:

Nine specified units.

3 units of English.

2 units of one foreign language.

2 units of mathematics.

1 unit of social science including history.

1 unit of natural science.

Two additional academic units.

One or both of these units must be advanced work to meet the requirement of a second major of three units.

Four units left as a margin for whatever work best meets the needs of the individual.

C. REASONS FOR THE ADOPTION OF THIS DEFINITION AS THE BASIS OF COLLEGE ADMISSION

College admission should be based solely upon the completion of a well-planned high school course. The committee submits the following argument in defense of this proposition:

First: On the one hand, many students do not go to college because they took those courses which were dictated by their aptitudes and needs instead of courses prescribed by the colleges.

On the other hand, many students do not take the courses which they need because they think they may go to college.

A committee of the Boston Head Masters' Association, in a report approved by that association last fall, stated the difficulty as follows: "It frequently happens that a pupil in the public high school does not discover that he is likely to go to college until one, two, or three years of the high school course have been completed. As matters stand now, many of the courses in which he has received instruction and in which he may have done excellent work are entirely useless to him in so far as he may apply them to the purposes of college admission. The committee are of the opinion that this is decidedly wrong."

The idea that the student should, early in his high school course, decide whether he is going to college ignores one of the chief functions of the high school; namely, that of inspiring capable students with the desire for further education. It is coming to be clearly recognized that the chief characteristic of education in a democracy, as contrasted with that in a society dominated by class distinction, is the principle of the "open door." This principle of the "open door" is part of the great idea of the conservation of human gifts. It demands that personal worth should be recognized wherever found. The college is one of the many doors that should be kept open. The colleges themselves bear tribute to this principle in the innumerable scholarships that they offer to boys and girls in humble circumstances. In fact, it has long been recognized in this country that one boy who seeks a college education because of a strong inner purpose in the face of obstacles is worth to the college and to society a dozen boys who go to college merely because it is regarded as the proper thing to do.

Second: The attempt that is often made to supplement the work now required by the colleges with such additional work as is required by the community and by a more adequate understanding of the needs of real boys and girls, is highly unsatisfactory. May 7, 1910, the High School Teachers Association of New York City issued a statement in which they affirmed:

"We believe that the interests of the forty thousand boys and girls who annually attend the nineteen high schools of this city cannot be wisely and fully served under present college entrance requirements. Our experience seems to prove the existence of a wide discrepancy between 'preparation for life' and 'preparation for college' as defined by college entrance requirements.

"The attempt to prepare the student for college under the present requirements and at the same time to teach him such other subjects as are needed for life is unsatisfactory. Under these conditions the student often has too much to do. The quality of all his work is likely to suffer. The additional subjects are slighted because they do not count for admission to college. In such a course it is impossible for the student to give these subjects as much time and energy as social conditions demand."

Third: Even by faithfully following the usual college prescription, the best preparation for college is not secured. Abraham Flexner,

in his book "The American College," shows how the college is standing in its own way. He says that "The motive on which the college vainly relies, self-realization, has got to be rendered operative at the earlier stage." "As a matter of fact," he adds, "the secondary period is far more favorable than the college to free exploration of the boy." The restrictive preparatory courses prescribed by the colleges do not afford the kind of experience needed in the high school.

Fourth: In the attempt to prepare for the widely varying requirements of different colleges the energies of the school are dissipated. The energy that should be devoted to meeting actual individual needs of students is expended upon the study of college catalogs. An institution that should be encouraged to develop internally is made subordinate and subservient. As an illustration of the confusion in the requirements of different colleges, we find that one college requires one foreign language, counts work in a second, and gives no credit for a third; another college requires two foreign languages, and requires one unit in a third, unless music or physics is presented as a substitute; and a third college absolutely requires three foreign languages.

Fifth: But by far the most serious objection to the present condition is, as Commissioner Snedden says, to be found in the restrictive effect upon true high school development. The high school to-day is the arena in which our greatest educational problems should be worked out. High school attendance in this country has increased almost fourfold within the last twenty years. If the college will recognize the true function of the high school this marvellous growth will continue unabated and the American high school will become an institution unparalleled as a factor for democratic living. It is doubtful whether any nation ever before possessed such an opportunity.

SUPPLEMENTARY REPORT

The committee submits the following additional statement and recommendation:

The universal education to which our institutions are now committed is radically different from the education for a literary class to which we were formerly devoted. So long as our education was de-

signed for the few it was possible to require candidates for that education to conform to a certain definite intellectual type, and to reject all other candidates. That type was defined in terms of Latin, Greek, and Mathematics—substitutes not allowed. This definition actually debarred many individuals who did not entirely conform to the type but who possessed other strong qualities that would have made them valuable members of the learned professions. Nevertheless, the injustice of this procedure aroused no strong opposition because there were a sufficient number of other candidates conforming to the type to fill the very limited number of positions in the then existing professions.

As soon as the advantages of a higher education made a strong appeal to a somewhat larger group of men and women, the rigor of the former requirement of Latin, Greek, and Mathematics was relaxed by reducing the amounts required and by allowing a substitution of modern language for part or all of the classical languages. This process was characterized by its opponents as "letting down the bars." Such it was, not so much in the sense that it made education easier, as in the sense that it permitted education to make its appeal to a much larger group of men and women.

We believe that the time has arrived when it is the duty of those engaged in education to consider the importance of making our education appeal to still other students. To-day it is impossible in many communities for a boy or a girl to obtain even a high school education unless he or she can do passing work in both mathematics and a foreign language. Schoolmen in general are familiar with students, usually girls, who do good work in languages, history, and certain sciences, but who cannot master high school or college mathematics. There are other students, mostly boys, who do good work in mathematics, science and history, but who have exceptional difficulty with foreign languages. A student of the latter type would find ample field for the exercise of all his linguistic ability in a reasonable mastery of the English language.

In the East we find a tendency to attach particular importance to the study of foreign languages, and in the West we find a tendency to emphasize mathematics. But native abilities are not geographical quantities.

We believe that insistence upon the study of mathematics and foreign language as a *sine qua non* of an education is based largely upon

the belief that both are *indispensable* for intellectual discipline. But we know that many of our greatest men have been deficient in one or the other of these accomplishments. They evidently secured their intellectual power by other processes. The disciplinary possibilities of other subjects are not yet fully recognized.

In view of the foregoing statement, we recommend that Section 4 of the definition of a well-planned high school course, be supplemented by the following additional statement:

4 (a). IN PLACE OF EITHER TWO UNITS OF MATHEMATICS OR TWO UNITS OF A FOREIGN LANGUAGE, THE SUBSTITUTION UNDER PROPER SUPERVISION SHOULD BE ALLOWED OF TWO UNITS CONSISTING OF A SECOND UNIT OF SOCIAL SCIENCE (INCLUDING HISTORY) AND A SECOND UNIT OF NATURAL SCIENCE.

In other words, there should be allowed under proper supervision the selection of four units from the following:

- (1) Two units of one foreign language.
- (2) Two units of mathematics.
- (3) Two units consisting of a second unit of social science and a second unit of natural science.

According to this provision it would be possible under proper supervision to substitute the work in columns (B) or (C) for the work in column (A).

	(A)	(B)	(C)
English.....	3	3	3
Foreign Language.....	2	2	0
Mathematics.....	2	0	2
Social Science.....	1	2	2
Natural Science.....	1	2	2
	—	—	—
Total specified.....	9	9	9
To which must be added to make another major.....	1 or 2	1	1
Total.....	10 or 11	10	10

Consequently the student without mathematics must present three units in two subjects and two units in the two remaining subjects, thereby demonstrating ability in four lines of work.

Similarly, the student without foreign languages must present three units in two subjects and two units in the two remaining subjects.

TO CARRY OUT THIS PLAN WE WOULD URGE THAT AT LEAST MANY OF THE LARGER COLLEGES SHOULD MAKE SPECIAL PROVISION TO CONTINUE THE EDUCATION OF STUDENTS OF WHOM IT HAS BEEN DISCOVERED THAT THE REQUIREMENT OF MATHEMATICS OR THE REQUIREMENT OF FOREIGN LANGUAGE IS AN OBSTACLE TO THE CONTINUATION OF THEIR EDUCATION.

Respectfully submitted,

CLARENCE D. KINGSLEY, *Chairman*,
Manual Training High School, Brooklyn, N. Y.

WILLIAM M. BUTLER,
Principal, Yeatman High School, St. Louis, Mo.

FRANK B. DYER,
Superintendent of Schools, Cincinnati, Ohio.

CHARLES W. EVANS,
Principal, High School, East Orange, N. J.

CHARLES H. JUDD,
Professor of Education, University of Chicago, Ill.

ALEXIS F. LANGE,
Dean of College Faculties, University of California, Cal.

W. D. LEWIS,
Principal, William Penn High School, Philadelphia, Pa.

WILLIAM ORR,
Deputy State Commissioner of Education, Boston, Mass.

WILLIAM H. SMILEY,
Principal, East Side High School, Denver, Colo.

Committee.

The chairman herewith appends the following statement from Prof. Charles H. Judd, expressing the opinion that even greater latitude should be allowed to the high school and explaining an important principle that should at this time be brought to the attention of all concerned with the relations of school and college.

MY DEAR MR. CHAIRMAN:

In signing the report, I am very glad indeed to express my sympathy with the general outlines of the whole statement which is here made by the committee. It is my opinion that somewhat greater latitude should be allowed the high school in the organization of its courses. To this end, I should personally prefer that the various requirements be not specific in terms of the subjects. The only specification which I find it possible to favor is that which requires a certain amount of coherent work in the high school. To this end, I believe that it would be wiser to require two majors of three units and one minor of two units. This is in keeping with the plan recently adopted by the University of Chicago.

One other principle should, I believe, be incorporated in any report which deals with the relations of high schools and colleges. These two institutions should follow up the work of high school students much more completely than is now done. A student who comes from a high school into a college, should have his relative rank in the high school class reported to the college. The work he is carrying on in the college should be carefully observed, and reports should be sent back to the high school, stating the rank of the student in college. Both institutions would profit by this exchange of information. The college would learn by such a comparative study of the student's work whether or not its courses are articulating directly with those of the high school. The high school would learn whether or not it is articulating with the college. It does not necessarily follow that the high school should in every case articulate with the college in such a way as to insure the high standing of its students in college.

Without attempting to pass on that question, however, the information that would be gained by the study of relative marks would be very valuable for the purpose of bringing to the consciousness of both institutions the character of the work which the students are able to do.

I should appreciate the opportunity of adding this comment to the report if you do not feel that it would encumber the committee's statement. In any case, I am prepared to sign the general report. These comments are merely added in the hope that the principles outlined in this report may be extended somewhat further than the committee has found it expedient to carry them.

CHARLES H. JUDD.

INDEX

- ABSTRACTION IN ENGLISH**, 227.
Academic departments, 72.
Academics, 445.
Academy, early American, 55, 62.
Activities, appreciative, outdoor, productive, 436, 440.
Adenoids, 353.
Administration of high school, *Introd.*, chaps. I, IV, and V.
Administrative control of instruction, 108, 113.
Adolescence, characteristics of, 69, 236; pedagogical implications respecting, 70.
Adolescents, value of psychology to, 452, 453.
Æsthetic training, as aim of certain studies, 319, 328.
Æsthetics, credit for, 319, 320; in public speaking, 247; prejudice against study of, 321.
Agricultural colleges, 386; training courses for teachers, 394.
Agricultural high school, 422.
Agriculture, 206; aims in high school, 382; college entrance credit, 387; definition of, 381; number of high schools teaching, 385-387; relation to grade work, 385.
Aims of agriculture, 382; of Latin, 258.
Alabama, 386.
Alcohol, relation to venereal disease, 369, 379.
Algebra, 131, 132, 137-140, 143, 144.
Algorism, 129.
Al-Khowarizmi, 129, 130.
Allowances, 431, 437.
Altruism, motive in English, 235.
American high school, *Introd.*, v.
Analysis, structural, 234, 236.
Angell, J. R., 444 (foot-note).
Apparatus, physics, 168, 175.
Applied science in secondary schools, 214, 215.
Appreciation courses, 325, 326, 327; credit for, 327, 329; plan for, 327; standards of, 326; value of, 326.
Aristotle, 200.
Arithmetic, 129-133, 137, 138, 140.
Arkansas, 386.
Art, appreciation of, 304, 315; educational function of, 305; educational history of, 306; educational importance of, 304; elementary school preparation in, 313; industrial values of, 306; preparation of teachers in, 315.
Art and morals, 229, 232.
Assignments in English, 235, 237.
Athletics and the sex problem, 379.
Audience in English, 234, 236.
Authority, 208.
Automatism, 32.
BABBITT, Irving, 35, 36.
Bacteriology, 349, 358, 359.
Bad English, 230-235.
Benefits through English, 233, 256.
Bergen, J. V., 202.
Berzelius, laboratory of, 193.
Bible, use of in the school, 334.
Bibliographies, *Introd.*, xii.
Billings, J. S., 348.
Biology, 198, 352, 357, 359.
Biology courses, 206.
Birge, Edward B., 327.
Bishop, J. Remson, 401.
Boards of education and control of instruction, 114.
Boethius, 130.
Boston, 354.
Boston High School, first American High School, 445 (foot-note); of Commerce, 421; of Practical Arts, 422.
Botany rhetoric, 233.
Boy-problem, 369.
Briggs, Thomas H., 253.
Brooks, Phillips, 339.
Brown, E. E., 77, 445 (foot-note).
Brown, M. R., 201.
Budgets, 431, 432, 438.
Bunker, F. T., 103.
Burne-Jones, 462.
Butler, N. M., 317, 320.

- CABOT, R. C., 348.
 California, 386.
 Carbolic acid, antidote for, 185.
 Carelessness, 209.
 Carnegie, Andrew, 400.
 Carnegie Foundation, 5, 32.
 Castiglione, 49.
 Chancellor, W. E., 125, 337.
 Character-building, 233.
 Charters, W. W., 444 (foot-note).
 Chastity, relation to health, 372.
 Cheating, 210.
 Chemistry, 352, 357; course, need for, in high schools, 183-186; place to be allotted to, 195, 196; time to be allotted to, 195, 196; direct usefulness of, 185; educative value of, 185, 186; influence of, on civilization, 184, 185; laboratory equipment, 192-194; laboratory work, suggestions as to, 194, 195; per cent of students studying, 187; teacher, equipment of, 196, 197; teaching, difficulties of, 188-190; teaching, suggestions as to, 190-192; textbooks, choosing of, 197; what is 183, 184.
 Chicago Manual Training School, 411.
 Chicago, University of, separation of psychology from philosophy, 443.
 Choosing a color scheme, 433, 439.
 Chorus work, 318, 319; aesthetic value of, 323; as social function of school, 324; credit for, 325; plan for, 324; practice hours for, 324, 325.
 Cincinnati, University of, and industrial education, 419.
 Civics, in connection with public speaking, 246.
 Civil government, teaching of, 299, 300.
 Clapp, John M., 253.
 Class hour in English, 235, 237.
 Class teachers and supervisors, 124.
 Classical literature, 48, 55, 56.
 Cleveland, Grover, 403.
 Cleveland Technical High School, 421.
 Clubs, musical, credit for, 330; value of, 329.
 Coe, G. A., 335.
 Coeducation and instruction, 126.
 College domination, 201, 208.
 College Entrance Board, 143; definition of physics unit, 159.
 College, entrance credit for agriculture, 387; entrance credit for music, 329; entrance requirements, 111.
 Collège, French, 60.
 Colleges and instruction, 115.
 Commercial course, the, 410.
 Commercial education, additional courses, 401; aims of, 397; a practical illustration, 398; better preliminary preparation, 406; growth of, 396; obstacles to, 407; subjects in, 400; success of, 399; undeveloped condition of, 397.
 Commercial English, 230.
 Committee of Five, report of, 293, 294.
 Committee of Nine, report of, 400.
 Committee of Seven, report of, 292, 293.
 Committee of Ten, 73, 227; report of, 292.
 Committee of Twelve, report on modern language teaching, 285.
 Composition, 329; English, 228-234; Latin, 272.
 Concepts, ultimate, in physics, 148.
 Concrete geometry, 136, 140.
 Conduct, 434, 439.
 Conferences on English, 231.
 Consequences, fear of, 376.
 Consolidated school, 101.
 Consultation hour, 235.
 Consultative committee, 88.
 Contributors, *Introd.*, vi.
 Control of instruction, external, 107; internal, 117.
 Controversy, formal discipline, 36.
 Cooley, C. H., 337.
 Co-operation, of high school and college, 4, 5; of teachers, 235.
 Co-operative industrial education, 419.
 Correctness in English, 230-233.
 Correlation, of agriculture and science, 391, 392; between subjects, 205.
 Corson, Hiram, on literary appreciation, 247.
 Coulter, J. M., 198, 202.
 Course of study, high school, 99; Latin, 266; making of, 125; meaning of, 111.
 Courses, in agriculture (one year, 389; two to four year, 390; component parts, 390, 391); in English classics, 242; in English composition, 240; in modern languages, 285.
 Courtesies and customs of the table, 434, 440.
 Crampton, W., 354, 355.
 Credits, 328.
 Criticism in English, 236.

- Criticisms of definitions of the physics unit, 168, 170.
- Crosby, C., 350, 351.
- Cultural studies, agriculture, 383, 384.
- Curriculum, agriculture in the, 380, 390; bases of, 25-27; experiments with, 1, 9, 23; for six year high school, 95; making of, 125; meaning of, 111; problems, 23, 24; public interest in, 1, 2, 11, 15, 26, 27.
- DAVIDSON, Thos., 7, 36.
- Davis, B. M., 202.
- Dawson, J., 204.
- Debates, high school, 250; statistics concerning, 254.
- Definitions of the physics unit, 152, 156, 159.
- De Garmo, Chas., 22, 307.
- Democratic spirit in English, 226.
- Departmental teaching, advantages, 80, 90; in seventh and eighth grades, 80 ff., 100.
- Deportment, in classes studying literature, 248.
- Descartes, 144.
- Design, aims, 310; courses in, 313; elementary school preparation for, 314; industrial demand for, 306; natural demand for, 305.
- Development of the physics course, history of, 150; future of, 180.
- Dewey, John, 14, 33, 75, 76, 115, 126, 341, 442, 444 (foot-note), 458 (foot-note).
- Differentiation of instruction, 93, 96.
- Diophantus, 130.
- Disciplinary value, of agriculture, 384; of Latin, 259.
- Discipline, formal, chap. II.
- Disease, venereal, 364, 368, 376, 377, 378, 379; crusades against, 364, 368.
- Domestic art, 428, 429, 437.
- Domestic science, 428, 429, 438.
- Downing, Dr., 460.
- Dramatic clubs, 238, 251.
- Draper, A. S., 102.
- Drawing, free-hand, courses in, 311; elementary school preparation for, 313; value in design, 309; in industries, 309; in pictorial effects, 310; in science, 308.
- ECONOMY, principle of, in science, 147.
- "Education and Life," 214.
- Education, meaning of, 106; vocational, 409.
- Educational value of physiography, 218, 219; Professor Davis quoted, 219.
- Efficiency, social, 226, 233.
- Egypt, 129.
- Elementary education, aim of, 76; definition of, 75.
- Elementary school course, aim of, 75, 76; criticisms of, 73; departmental teaching in, 80 ff.; early characteristics of, 68; promotion by subjects in, 92, 101; secondary subjects in, 93; six-year course, 73, 75, 79, 103.
- Elementary science, 380.
- Elementary vocational training, 415.
- Eleutheromania, 35.
- Emissions, physiology of, 371.
- Emotions, training of, in public speaking, 248.
- English, aims in teaching, 226, 233; principle of method in, 227; purpose of studying, 227, 237; ideals in studying, 230; preparation for teaching, 239; motives for studying, 235; scheme of work in, 240; vocational demands on, 231, 239.
- English classics, course in, 240-242; home reading in, 236; methods of teaching, 236; motives for studying, 236; oral interpretation of, 237; text-books, 236; class hour in, 237.
- English composition, oral, 235; class hour in, 235; text-books in, 233; methods of teaching, 235; ideals in, 230; publication in, 234, 236, 238; paragraph method in, 233; choice of topics for, 234, 239; theme reading, 235.
- English helped by Latin, 260.
- English secondary education, 59.
- Entrance requirements, 111, 188, 230, 266, 329, 387.
- Equipment, for instruction, 120; of the physics laboratory, 168, 172, 175.
- Ethics in adolescent education, 340, 341.
- Euclid, 131.
- Exhibits and appliances, office, 405.
- Experiments, in psychology, 457; with curriculum, 1, 9, 23.
- External control of instruction, 107.
- Eyesight, 352.
- FAUNCE, Pres. William H. P., 402.
- Field, Marshall, 400.
- Findlay, J. J., 20.

- Fine Arts, 428, 429, 439.
 Fitchburg plan of industrial education, 419.
 Floors and floor coverings, 433, 439.
 Folk and æsthetic dancing, value of, 319.
 Foreign influence of English, 230, 231.
 Foreign school systems, 68, 69, 79.
 Form in English, 231.
 Formal discipline, chap. II.
 Fraternity, high school, 379.
 French, high school course in, by years, 287.
 French or German? 284.
 French secondary education, 60.
 Froebel, 442.
 Function, functional point of view in psychology, 458.
 Function of physiography, 215, 216.
 Function, reproductive, 361, 370; attitude of society toward, 361.
 Fundamental concepts in physics, 148.
 Furniture, 433, 439.

 GAILLARD, Edwin White, 461.
 Galileo, 167, 168.
 Geographical laboratories, 217, 218; necessary apparatus, 218.
 Geometry, 129-133, 136, 137-140, 144, 145.
 Georgia, 386.
 Gerhard of Cremona, 130.
 German, high school course in, by years, 286.
 German influence on English, 230, 231.
 German secondary education, 59.
 Germ-carriers and venereal disease, 363.
 Gonorrhœa, 363, 377, 378.
 Gouin, a worker in the psychological method of teaching modern languages, 280.
 Graduate course, Harvard University, 400.
 Grammar, English, 228.
 Grammar method of teaching modern languages, 278.
 Graphs in mathematics, 135, 136.
 Greek mathematics, 129, 130.
 Gulick, L. H., 350.
 Gymnasium, 50, 52, 58.

 HABIT, Rowe on, 33; Sidis on, 34, 35; William James on, 36, 37; Thos. Davidson on, 37; and the teacher, 40-44.
 Hadley, William A., 404.
 Halliday, E. M., on oral English committee, 253.
 Hamilton, James, early teacher by inductive method, 278.
 Hanus, P. H., 76.
 Harmony, 329.
 Harvard College, chemistry credited for admission, 188; requirement in English, 230.
 Health, 434, 440.
 Hearing, 353.
 Heath, H., 202.
 Henderson, E. N., 340, 444.
 Heness, Gottlieb, a founder of the natural method, 279.
 Herbart, 442.
 High school, aim and function, 76, 77; building, 88; courses of study, 99; curriculum, 78; early character of, 72; "Junior," 86, 87, 103; organization of, 75; origin of, 63; relation of, to college, 65; rural, 101; school days, 98; "Senior," 86, 87; sex problem in, 368.
 High school course of study (programme of studies); aim, 76, 77; early character of, 72; differentiation in, 79-81; reorganization of, 80; six-year course (curriculum), 73.
 High school course in German, by years, 286; courses in modern languages, results to be attained, 287; music teaching, how to improve it, 320, 321.
 High school organization, contemporary defects in, 71, 74; origin of the system, 71; six-year high school, 75, 79.
 High schools, agricultural, 386; free, 63; types of, 65.
 Higher institutions, control of instruction, 115.
 History, aids in teaching, 298, 299; high school courses in, 293, 294; methods of teaching, 295, 298; preparation of teacher of, 301-303; qualifications of teacher of, 301; recognition of the values of, 291-295; values of the study of, 288-291.
 History, of biology, 200; of the high school course in physics, 150; of physics development, 166.
 Home, decline of, 334; location and structure, 432, 437, 438; home nursing, 432, 433, 438; home study, 98.
 Horne, H. H., 341, 444 (foot-note).

- Horner, 144.
 Hunt, Mrs. Mary H., 347.
 Hunter, G. W., 302, 304, 351.
 Hygiene in the college, 356.
 IDAHO, 386.
 Ideals in English, 226, 230, 233, 240.
 Illustrative material in teaching modern languages, 281.
 Imagination in English, 229.
 Incentives to learn English, 235, 236.
 Indianapolis, 327.
 Indianapolis Manual Training High School, 420.
 Inductive method of teaching modern languages, 278.
 Industrial courses, 81.
 Industrial education, 9, 10.
 Instruction, administrative control of, 109, 113; college control of, 115; external control of, 107; identity vs. equality, 126; inspectorial control of, 110, 115; legislative control of, 108, 113; organization and control of, 106; plans of, 112; State control of, 116; supervisory control of, 109, 115.
 Interest, elements of, in physics, 146.
 Inter-relations of sciences, 213.
 Introductory and correlative functions of physiography, 219, 220.
 Iowa, 350.
 Issues, educational, 12, 13.
 JACOTOT, early teacher of French by inductive method, 278.
 James, William, 33, 36, 43, 452.
 Jastrow, Joseph, 33.
 John of Halifax, 129.
 Jordan, D. S., 302.
 Judd, C. H., 444 (foot-note).
 Junior high school, 86, 87, 103.
 KELLOGG, V. L., 302.
 Kelly, H. A., 302.
 Kinds of educational institutions, 7-10.
 Knowledge and conduct, 341, 342.
 Knowledge of earth science a necessity, 216.
 LABORATORY WORK, 207, 210; in physics, 151, 164, 168, 172; mathematics, 135.
 Lange, A. F., 28.
 Language study should begin early, 277, 283.
 Larned, J. N., 342.
 Latin, 205, 257; aims of, 258; authors read, 269; composition, 272; courses of study, 266; grammar, 273; number of pupils in, 257; teachers, 275.
 Latin or German? 284.
 Leddike, F., 77.
 Legislation, agriculture, 381, 386.
 Legislative control of instruction, 108, 113.
 Leisure time, the use of the, 435, 436, 440.
 Letter-writing, 231.
 Liberal education, 46.
 Librarian, assistance for, 463; duties of, 463.
 Library, courses, 466; purposes of, 464; questions, 466, 467; teaching the use of, 464, 465.
 Library instruction, 465; value of, 469.
 Liebig, first laboratory for student instruction, 187.
 Linville, H. R., 202, 203, 206.
 Literary societies, 249, 254.
 Literature, 428, 429, 440; English (see English Classics); oral interpretation of, 247; true test in reading, 247.
 Locke, 57.
 Louisiana, 386.
 Lycée, French, 60.
 MACH, Ernst, 147, 148, 168.
 Mac Vannel, J. A., 111.
 Maine, 386.
 Mal-nutrition, 353.
 Mann, C. R., 170.
 Manners, the significance of, 434, 440.
 Massachusetts, 351, 353, 386.
 Massachusetts law regarding vocational education, 415.
 Masturbation, 372, 378.
 Mathematics, 205; beauty, 132; blackboard work, 141; correlation, 134, 137-140; history of, 128-131; laboratory methods, 135; oral work, 138, 139; practical, 132, 134; symmetry, 132; teachers, 142, 143; use of, in the physics course, 169; written work, 141.
 Maxwell, W. H., 354.
 McAndrew, Principal, 467.
 McDonald, Wm., 25.
 McKinley, William, 403.
 McMurry, Frank, 444 (foot-note).
 Mead, G. H., 195.
 Mechanical physics, 327.

- Medieval secondary education, 47.
 Medical inspection, 352, 353, 354.
 Menomonic (Wis.) High School, 416.
 Menstruation, 371.
 Mero, E. B., 353.
 Merriam, J. L., 21.
 Method in physiography, a better, 221, 222; basis of method, 222.
 Methodology of English, 227.
 Methods, in psychology, 455.
 Meumann, E., 43.
 Meylan, G. L., 356, 358.
 Michigan, 386; State Library Commission, 468.
 Minnesota, 386.
 Mississippi, 386.
 Missouri, 387.
 Model dining-room, 434.
 Model schools, 20.
 Modern language study, beginnings of, 278.
 Modern languages, as substitute for ancient in American college requirements, 279; displace ancient in certain Prussian schools, 279.
 Mohammedans, 129.
 Moral culture, need of, in the schools, 332.
 Moral education, 19-21; in connection with public speaking, 246.
 Moral element in education, neglect of, 333.
 Moral instruction, methods of, 337-342; programme of study in, 342-345.
 Moral training, importance of, in modern life, 332.
 Moral value of physics study, 149.
 Motives in English, 235.
 Mosier, W. F., 253.
 Munich, 9.
 Museum work, 206.
 Music, 428, 440; and literature, 237; the art of our times, 325; the most social of arts, 325.
 Music courses, as generally classified, 317; new classification, 318.
 NARCOTICS AND STIMULANTS, 348, 349.
 National Education Association, 73, 79, 143, 388 (foot-note); committees of, 73, 227, 285, 292, 293, 294, 400.
 Natural method of teaching modern languages, 279.
 Nature study, relation to agriculture, 382, 385.
 Nebraska, 386, 387.
 Nervous prostration, induced by dramatic presentations, 252.
 New England Association, 231.
 New Jersey, 386, 387.
 New method in physiography, 214.
 New York, 386; law regarding vocational education, 416; State Education Department, 143; State of, psychology in academics, 445; State Science Teachers' Association, 349.
 New York City, 352, 354.
 Nichols, Edw. L., 182.
 Nichols, Ernest F., 148.
 Night-dreams, significance of, 371.
 North Central Association, definition of physics unit, 156.
 Notation, knowledge of, 323.
 OBER-REALSCHULEN, 58.
 Observation in English, 227, 228.
 Obstacles to teaching, 208.
 Ohio, 387.
 Oklahoma, 386.
 Oral English, 235, 237; resolutions of Illinois teachers of English concerning, 253.
 Oral interpretation of literature, 247.
 Oratorical contests, 251.
 Oratorio choruses, effect on voice, 324; value of, as experience after school, 324.
 Oregon Library Commission, 468.
 Osborn, Henry, 33.
 O'Shea, M. V., 444.
 Outlining in English, 235.
 PALMER, G. H., 337.
 Paragraph method in English, 233.
 Parker, Bertrand DeR., 400.
 Parker, Colonel, 442.
 Pathology, venereal, 376, 377.
 Patriotism, taught in public speaking, 246.
 Pedagogical value of physics, 149, 165.
 Pedagogies, multiplicity of, *Introd.*, vi, vii; specialized, *Introd.*, x, xi.
 Pennsylvania, 386.
 "People's College," 96.
 Pestalozzi, 200, 442.
 Phillips Exeter Academy, 445.
 Phonetic method of language teaching, 280.
 Physical development, incentives to, in public speaking, 247.
 Physical education, present day interest in, 346; revival of interest in, 353.

- Physics, 146, 352, 357.
 Physiographic texts, changes in, 216, 217.
 Physiography, defined, 212; distinction between physical geography and, 220; explanation of earth phenomena, 212, 213; explains phenomena, 215; fundamental science, 213; in curriculum, 219; its relation to general geography, 212; justification as pure or applied science, 218, 219; not duly appreciated, reason, 221; promise of future, 225.
 Physiology, 206; and hygiene, 346; in the grades, 347; in the high school curriculum, 347; nature of the course, 357; reasons for failure, 348; status in the high school, 350.
 Pictures and casts, 433, 439.
 Place of physics in high school curriculum, 180.
 Plato, 37, 39, 128.
 Playground, 353, 354, 359.
 Plexus of evils, 74.
 Poetry, reading of, 247, 248.
 Political economy, teaching of, 300, 301.
 Poor teaching, 209.
 Practical applications of physics, 144.
 Practical arts, pupils, the central idea, 429; by whom taught, 430.
 Practical courses, 428.
 Practical value of geographical knowledge, 216.
 Preparation, for teaching English, 239; of Latin teachers, 275; of the teacher of modern foreign languages, 282; pupils', 124; teachers', 118.
 Principals and instruction, 117.
 Pritchett, H. S., 5.
 Private study, utilization and recognition of, 330.
 Programme of studies, 2, 4; meaning of, 111.
 Promotions, 92, 101.
 Prostitution, 364, 378.
 Psychology in high school curriculum, 441; (for general topics see also table of contents, chap. XXV).
 Puberty, significance of, 369, 375.
 Public criticism, 10, 15, 16.
 Public speaking, improvement in instruction in, 249; lack of text-books on, 249; occasions for, 250; place in training for the professions, 245; practical value of, 245; social value of, 246; teachers of, 244, 254, 255; when to be taught, 245.
 Public support, 11, 12.
 Publication in English, 234, 236, 238.
 Pupils, preparation, 124; tests of attainment, 126.
 Pythagorean proposition, 139.
 QUACKS, warning against, 378.
 Questions in English, 237.
 Quintilian, 46, 51.
 READING, 227, 242; of poetry, 248.
 Reading method of teaching languages, 278.
 Real-Gymnasien, 58.
 "Realien" in language teaching, 279.
 Realschulen, 55, 57; modern languages in, 279.
 Recreation and enjoyment, 435, 440.
 Reform method of teaching modern languages, 280.
 Reformation, reaction from, 54, 55.
 Regiomontanus, 130.
 Religion and morality, relationship between, 335.
 Renaissance, 45; secondary education, 49.
 Reporting, topical, 237.
 Reproduction, function of, 361, 371.
 Requirements in English, 231.
 Rhetoric as adaptation, 232.
 Rhetoricals, 230, 249.
 Richards, Mrs. Ellen H., "Cost of Living," 431.
 Ritter-Akademien, 55.
 Robert of Chester, 130.
 Roman mathematics, 129, 130; secondary education, 46.
 Roosevelt, Theodore, 403.
 Round Table, 238.
 Rousseau, influence on secondary education, 57.
 Rowe, S. H., 33.
 Royce, J., 40.
 Ruediger, W. C., 444.
 Rural high school, 101.
 Rural school teachers, psychology in their training, 447-449.
 SACROBOSCO, see John of Halifax.
 Sadler, M. E., 14, 336, 338.
 Salisbury, 221.
 Sanitation, 349, 357, 358, 359.
 Sauveur, Lambert, a founder of the natural method, 280.
 Scheme of treatment, *Introd.*, viii.

- School parties, 435, 440.
 School, responsibility of, for moral training, 336, 337; a socializing agency, 336, 339, 340.
 Schoolmen, opposition of, 396.
 Science, elementary, introductory, 389, 390.
 Scientific character of physiography, 213, 214.
 Seashore, C. E., 457.
 Secondary curriculum: Academy, American of nineteenth century, 63; academy, early American, 55, 56; English public school, 60; French lycée, 61; German, 59; Greek, 46; high school, 64; mediæval, 47; Renaissance, 49; Roman, 46; seventeenth century, 53, 54; sixteenth century, 50, 51.
 Secondary education, meaning of, 76, 77, 78.
 Self-abuse, 372, 378.
 Self-correction, 235.
 "Senior high school," 86, 87.
 Sequence in science courses, 204.
 Seven liberal arts, 47.
 Seventh and eighth grades, reorganization, 74, 75; methods of organizing, 82, 83; curriculum in, 97.
 Sex pedagogy, 361; constructive, 370; preventive, 375; primary, 375.
 Sex problem, the, 361; Church and the, 362, 365; Germany and the, 367; medicine and the, 362, 363, 364; methods of attacking, 368; parents and the, 361, 365, 367; schools and the, 365, 367, 368, 374, 377; society and the, 361, 362; sociologic aspects of, 378, 380; teachers and the, 366, 370, 377; university and the, 365, 367, 368, 377.
 Sex relationship, normal, 370, 372, 374, 380.
 Sheppard, James J., 400.
 Shopping, the ethics of, 431, 437.
 Sidis, Boris, 34, 35.
 Sight-seeing, for discipline, 225.
 Sight translation, in Latin, 268.
 Six-year high school, agitations for, 69, 73; advantages of, 100, 102; administration of, 82 ff.; aims of, 79; courses of study in, 99; curriculum of, 95; departmental teaching in, 80 ff., 100; differentiation in, 80 ff. (of schools, 82, 97, 101; of courses, 80, 81; of class sections, 85, 97; of methods, 96); equipment of, 88; flexibility in, 80; guiding principles respecting, 94; number of schools, 79 (note); organization of, 82 ff.; subdivisions of, 86.
 Slavery, white, 361, 378.
 Snedden, David, 15.
 Social efficiency, 226, 233.
 Social phase of geographical knowledge, 216.
 Social relations, 434, 440.
 Socrates, 37, 38.
 Spanish or German? 284.
 Special teacher of public speaking, 253.
 Specific disciplines, 234.
 Spelling, 228.
 Spencer, H., 37, 40, 347.
 Springfield, Mass., high school science course, 188.
 Standards of musical preparation, 322, 323.
 State aid, for agriculture, 386.
 State and vocational education, 414.
 State school system, 115.
 Stenography, commercial stand-point, 402; educational stand-point, 403; importance of, 402.
 Sterility, cause of, 363, 378.
 St. Louis, 354.
 Sturm, 50, 144.
 Subject-matter, aims of, 110.
 Summary of geographical characters, 215.
 Superintendents and instruction, 117.
 Supervised athletics, 98.
 Supervised study, 98.
 Supervisors and class teachers, 124.
 Supervisory control of instruction, 109, 115, 121.
 Supervisory power, tests of, 122.
 Syllabus, a, 437-440.
 Syphilis, 363, 377, 378.
- TEACHER TRAINING COURSES, 411.**
 Teachers, of agriculture, 394; of English, 236, 238, 239; of Latin, 275; of physics, 181; of physiography, 224, 225; of physiology and hygiene, 350; of public speaking (lack of, 244; resolutions of Illinois Teachers of English concerning, 254; preparation of, 255); influence of, 333, 339; qualifications of, 118; selection of, 119; temperament and training of, 330; for music teaching, training of, 209.
 Teaching staff of school to aid students, 327.

- Technical arts high schools, 420.
 Technical schools of agriculture, 386.
 Teeth, 352.
 Tests, pupils' attainment, 126; supervisory power, 122.
 Texas, 386.
 Textiles, 431, 437.
 Texts, agricultural, 392; commercial, 404; free, 121; for modern language teaching, 280; in English, 233, 236; in psychology, 454, 456; selection of, 120; old and new contrasted, 217.
 Theme reading, 235.
 Themes, musical, 320, 327.
 Theoretical value of earth science, 220, 221.
 Thompson, F. D., 253.
 Time for teaching, 205.
 Tone thinking, 323.
 Topical reports in English, 237.
 Training of teachers, 209; of physics teachers, 181.
 Transfer of training, 37-44.
 Transportation of pupils, 101.
 Trigonometry, 130, 137, 140, 141, 145.
 Trueblood, Thos. C., 250.
 Tufts, J. H., 341.
 Types of high school pupils, 79.
- ULTIMATE CONCEPTS IN PHYSICS, 148.
 Unison singing, value of, 324.
 Unit, of agriculture, 388; of physics, 152, 156, 159.
- VALUE, of biology, 198; of Latin, 258; pedagogical, of physics, 149, 165; practical and moral, of physics, 149.
 Varicocele, 379.
 Variety in English work, 234.
 Vice, effects of sexual, 363, 364, 376, 378.
- Viator, founder of reform method, 280.
 Virginia, 353, 386.
 Virtue, positive, 376.
 Vittorino da Feltre, 49, 51.
 Vocational courses, 82.
 Vocational demands on English, 226, 231, 239.
 Vocational guidance, 425.
 Vocational training, 409.
 Voice training, 248.
- WALLS, treatment of, 433, 439.
 Walter, H. E., 206; Max, 279.
 Wanamaker, John, 400.
 Wardrobe, the, 431, 437.
 Washington Irving High School, 422.
 Washington University Manual Training School, 411.
 What to avoid, 433, 439.
 Whitney, W., 205.
 Will, the training of, in public speaking, 248.
 Wilson, E. B., 198.
 Wisconsin, 386.
 Wisconsin law regarding vocational education, 416.
 Witmer, 457.
 Wöhler, visit of, to Berzelius, 193.
 Woman's Christian Temperance Union, 347, 348.
 Wood, T. D., 349.
 Worcester Trade School, 416.
 Work, social, opportunities for, 435, 440.
 Wundt and first psychological laboratory, 443.
- YOUNG MEN'S CHRISTIAN ASSOCIATION, 353.
- ZOOLOGY COURSES, 206.

Text-Books for Teachers Normal and Training Schools

PUBLISHED BY CHARLES SCRIBNER'S SONS
153-157 Fifth Avenue, New York

HIGH SCHOOL EDUCATION

Edited by Prof. C. E. JOHNSTON

Dean of the School of Education, University of Kansas 12mo, \$1.50

The most recent authoritative work on High School Education, representing the views of twenty-five leading educators. The book covers thoroughly the whole field of High School Education. Each chapter is devoted to one of the principal subjects and is written by a recognized authority.

SCHOOL MANAGEMENT

By SAMUEL F. DUTTON

Teachers College, Columbia University, New York 12mo, \$1.00

A concise and definite statement of the problems of school management, giving helpful suggestions for their solution. Adopted by Teachers' Reading Circles of Michigan, Indiana, Virginia, Alabama, and Georgia.

SCIENCE OF EDUCATION

By R. G. BOONE

University of California 12mo, \$1.00

Written from the point of view of recent psychology and philosophy, giving throughout the discussion the evolutionary interpretation to the educational process.

HISTORY OF EDUCATION

By THOMAS DAVIDSON 12mo, \$1.00

It has been said by an eminent critic that this book "exhibits a higher degree of scholarship than any other history of education in popular use."

Text-Books for Teachers Normal and Training Schools

MIND IN THE MAKING

By EDGAR JAMES SWIFT

Washington University, St. Louis, Mo.

12mo, \$1.50

From a wide study of biography, experience, and special investigation, the author shows convincingly that the so-called dulness and idleness of children are, in most cases, due to a failure to understand them.

GERMAN EDUCATION—Past and Present

By FRIEDRICH PAULSEN

Professor of Philosophy in Berlin University

12mo, \$1.25

In this volume of 310 pages, Professor Paulsen gives a concise yet comprehensive history of education in Germany, from ancient to modern times, writing especially for the teacher.

PSYCHOLOGY FOR TEACHERS

By C. LLOYD MORGAN

Principal of University College, Bristol, England

12mo, \$1.25

A systematic presentation of the principles of psychology useful to all teachers. The new edition of this book has been completely revised and rewritten.

ELEMENTARY LOGIC

By WILLIAM J. TAYLOR

Brooklyn Training School for Teachers

12mo, \$1.25

The book gives special attention to the bearings of logic upon the problems of education.

CHARLES SCRIBNER'S SONS, NEW YORK

Text-Books for Teachers Normal and Training Schools

THE TEACHER AND THE SCHOOL

By **CHAUNCEY P. COLGROVE**

Head of the Department of Professional Instruction in the Iowa State
Teachers' College, Cedar Falls, Iowa

12mo, \$1.25

One of the most serviceable and inspiring books for teachers ever published. Adopted officially by State Reading Circles or officially prescribed for teachers' reading by the State Departments of *fifteen* states. It discusses every aspect of the teacher's work. The *Journal of Education* says: "No more helpful book for teachers' reading circles has appeared and no more complete book for classes in normal schools. Our examination of the book has been thorough and careful and we have no reservation in our commendation."

PRINCIPLES OF EDUCATION

By **FREDERICK ELMER BOLTON**

Director of the School of Education in the State University of Iowa

8vo, \$3.00

"Principles of Education" does what no other single book has yet done; namely, assemble the main, well-tested results of the scientific study of education from the psychological and biological view-points and present them in a way that secures continuity, correlation, and a unified interpretation. The author has done his work so skilfully that the book is not only scientifically accurate but distinctly readable and entertaining. For classes in the study of education in normal schools and colleges, for use in teachers' reading circles, and for the private library of every superintendent and teacher, it is an invaluable book. It is a masterly treatise in a most important field.

CHARLES SCRIBNER'S SONS, NEW YORK

The Great Educators

Edited by
Nicholas Murray Butler

"Just in the right time to meet the needs of a large number of teachers who are casting about to find something fundamental and satisfying on the theory of education."—HON. W. T. HARRIS, *U. S. Commissioner of Education.*

HORACE MANN and Public Education in the United States. By B. A. HINSDALE, Ph.D., LL.D., Professor of the Art and Science of Teaching in the University of Michigan. 12mo. \$1.00 net.

THOMAS and **MATTHEW ARNOLD** and their Influence on English Education. By SIR JOSHUA FITCH, LL.D., Late Inspector of Training Colleges in England. 12mo. \$1.00 net.

ARISTOTLE and the Ancient Educational Ideals. By THOMAS DAVIDSON, M.A., LL.D. 12mo. \$1.00 net.

ALCUIN and the Rise of the Christian Schools. By Professor ANDREW F. WEST, Ph.D., of the University of Princeton. 12mo. \$1.00 net.

ABELARD and the Origin and Early History of Universities. By JULES GABRIEL COMPAYRE, Rector of the University of Lyons, France. 12mo. \$1.00 net.

LOYOLA and the Educational System of the Jesuits. By THOMAS HUGHES, S.J. 12mo. \$1.00.

FROEBEL and Education through Self Activity. By H. COURT-HOPE BOWEN, M.A., Late Lecturer on Education in the University of Cambridge. 12mo. \$1.00 net.

HERBART and the Herbartians. By CHARLES DE GARMO, Ph.D., President of Swarthmore College. 12mo. \$1.00 net.

ROUSSEAU and Education according to Nature. By THOMAS DAVIDSON, M.A., LL.D. 12mo. \$1.00 net.

PESTALOZZI and the Modern Elementary School. By M. A. PINLOCHE, Professor in the University of Lille, France. 12mo. \$1.00 net.

The history of great educators is, from an important point of view, the history of education. These volumes are not only biographies, but concise yet comprehensive accounts of the leading movement in educational thought, and furnish a genetic account of educational history. Ancient education, the rise of the Christian schools, the foundation and growth of universities, and the great modern movements suggested by the names, are adequately described and criticised.

Copies, subject to the privilege of return, will be sent for examination to any Teacher upon receipt of the Net Price.

The price paid for the sample copy will be returned, or a free copy enclosed, upon receipt of an order for ten or more copies for Introduction.

Correspondence is invited, and will be cheerfully answered. Catalogue sent free.

CHARLES SCRIBNER'S SONS,

153-157 FIFTH AVE., NEW YORK.

2000. 10. 10.

YB 35316

580110

L B1607
J7
Educ. & Soc.

UNIVERSITY OF CALIFORNIA LIBRARY

